ORDER NO. MD9505057A2

Service Manual

AV Control Stereo Receiver

Receiver

SA-GX180

Colour

(K)...Black Type

Areas

Suffix for Model No.	Area	Colour
(E)	Europe.	(K)
(EG)	Germany and Italy.	

Please file and use this manual together with the service manual for Model No. SA-GX280, Order No. MD9505058C2.

Note: •This service manual is provided to indicate the main differences between the original model No. SA-GX280 (E) and the subsequent model No. SA-GX180 (E, EG).

CHANGES

■ SPECIFICATIONS

SA-GX280 (E)		SA-GX180 (E, EG)	
■ AMPLIFIER SECTION		**■ AMPLIFIER SECTION**	
Power output (at 240 V)		**Power output (at 240 V)**	
DIN 1 kHz (T.H.D. 1%)	2×80 W (4 Ω)	**DIN 1 kHz (T.H.D. 1%)**	2×60 W (4 Ω)
40 Hz–20 kHz continuous power output both channels driven	2×60 W (8 Ω)	**40 Hz–20 kHz continuous power output both channels driven**	2×40 W (8 Ω)
Input sensitivity and impedance		**Input sensitivity and impedance**	
CD, VCR 1, VCR 2, TAPE/DCC	200 mV/22 kΩ	**CD, VCR 1, TAPE/VCR 2/DCC**	200 mV/22 kΩ
S/N at rated power (8 Ω)		**S/N at rated power (8 Ω)**	
CD, VCR 1, VCR 2, TAPE/DCC	80 dB (IHF, A: 90 dB)	**CD, VCR 1, TAPE/VCR 2/DCC**	80 dB (IHF, A: 90 dB)
Frequency response		**Frequency response**	
CD, VCR 1, VCR 2, TAPE/DCC	10 Hz–40 kHz, ±3 dB	**CD, VCR 1, TAPE/VCR 2/DCC**	10 Hz–40 kHz, ±3 dB
Output voltage		**Output voltage**	
VCR 1 OUT, TAPE/DCC REC (OUT)	200 mV	**VCR 1 OUT, TAPE/VCR 2/DCC REC (OUT)**	200 mV
■ GENERAL		**■ GENERAL**	
Power consumption	160 W	**Power consumption**	170 W

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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■ CHANGE IN REPLACEMENT PARTS LIST

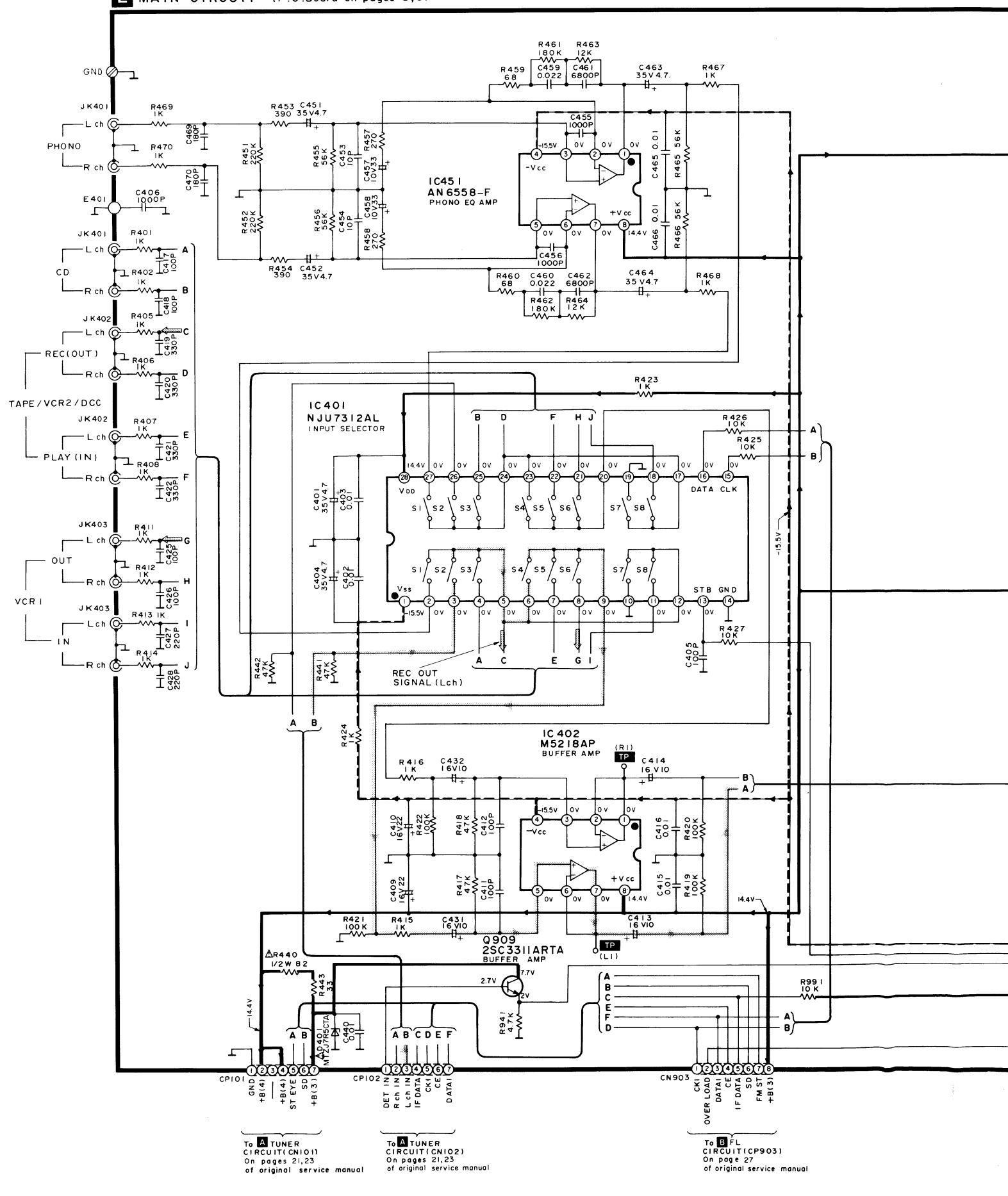
(SA-GX280 Service Manual of pages 38~43.)

Notes:
- Mentioned in this parts list is only those different from Model No. SA-GX280 (E). All other parts are the same as for SA-GX280 (E).
- Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
- [M] Indicates In Remarks columns parts that are supplied by MESA.

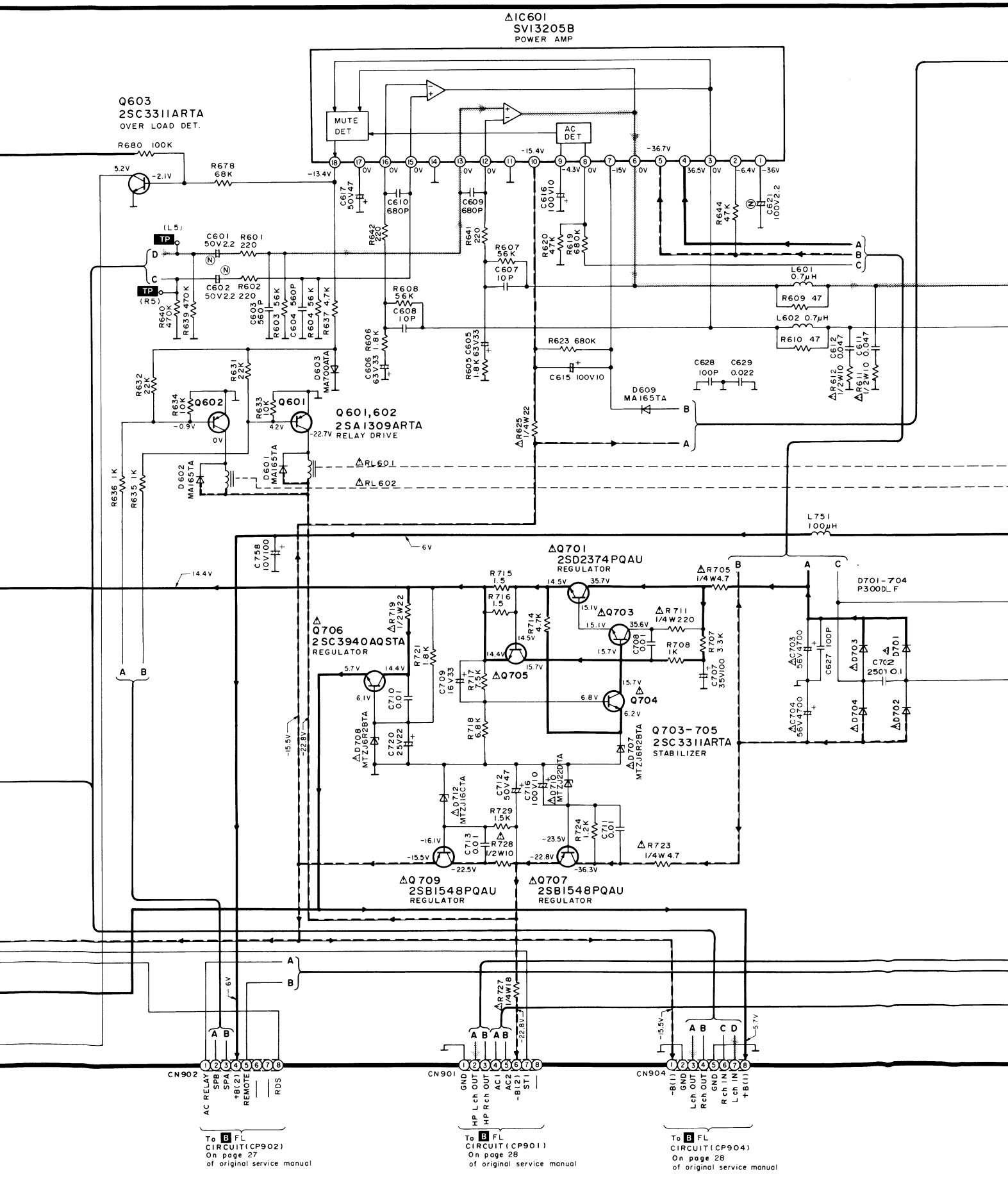
Ref. No.	Change of Part No. SA-GX280 (E)	Change of Part No. → SA-GX180 (E, EG)	Part Name & Description	Remarks
INTEGRATED CIRCUIT(S)				
IC601	RSN3306A	**SVI3205B**	POWER AMP.	⚠
TRANSISTOR(S)				
Q191~193	2SC3311AR	**2SC3311AR**	TRANSISTOR	(E)
		—	TRANSISTOR	(EG) Deletion
Q603	—	**2SC3311AR**	TRANSISTOR	Addition
DIODE(S)				
D605, 606	SB360L6508	—	DIODE	Deletion
D721~724	P300DLF	—	DIODE	⚠ Deletion
D932	MA165	**MA165**	DIODE	(E)
		—	DIODE	(EG) Deletion
D933	MA165	—	DIODE	Deletion
COIL(S)				
L101	ELESNR68MA	**ELESNR68MA**	COIL	(E)
		ELESN1R0MA	COIL	(EG)
L191	ELESNR68MA	**ELESNR68MA**	COIL	(E)
		ELESNR56MA	COIL	(EG)
TRANSFORMER(S)				
T701	RTP1N5E014-V	**RTP1N5E021-V**	POWER TRANSFORMER (MAIN)	[M] ⚠
COMPONENT COMBINATION(S)				
Z101	RLA6Z005M-T	**RLA6Z005M-T**	COMPONENT COMBINATION	(E)
		RLA2Z002M-T	COMPONENT COMBINATION	(EG)
SWITCH(ES)				
S951	EVQ21405R	—	VCR2	Deletion
CONNECTOR(S) AND SOCKET(S)				
CN301	RJS1A6603	—	CONNECTOR (3P)	Deletion
CN715, 716	RJS1A1101T1	—	CONNECTOR (1P)	Deletion
JACK(S) AND TERMINAL(S)				
JK301	SJFK5-1	—	VCR 2 IN TERMINAL	Deletion
JK302	SJFD7-6	—	VCR 2 OUT TERMINAL	Deletion
RESISTORS				
R145, 146	ERDS2TJ102	**ERDS2TJ102**	1/4W 1KΩ	(E)
		ERDS2TJ561	1/4W 560Ω	(EG)
R191	ERDS2TJ103	**ERDS2TJ103**	1/4W 10KΩ	(E)
		—	—	(EG) Deletion
R192	ERDS2TJ122	**ERDS2TJ122**	1/4W 1.2KΩ	(E)
		—	—	(EG) Deletion

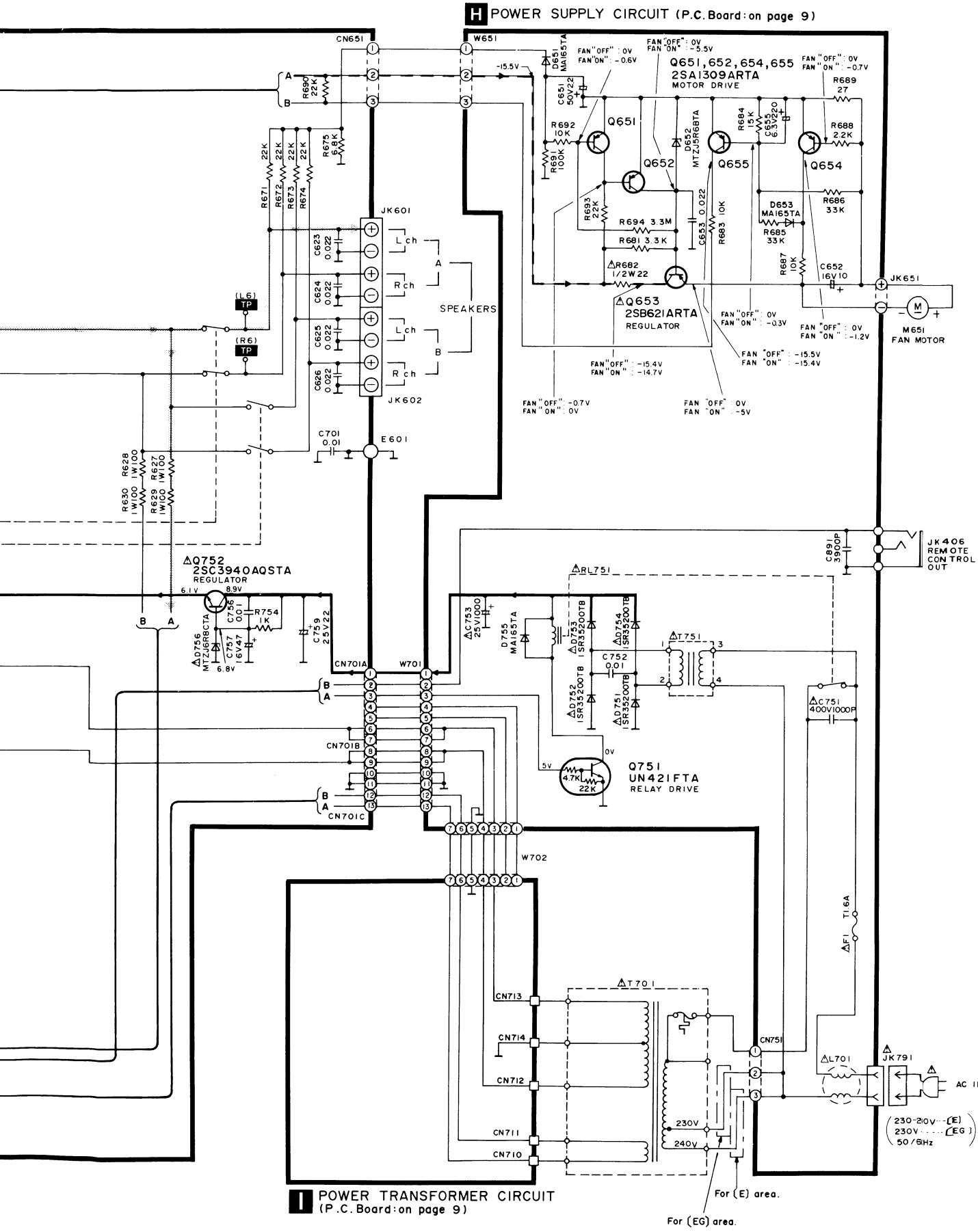
Ref. No.	Change of Part No.		Part Name & Description	Remarks
	SA-GX280 (E)	**SA-GX180 (E, EG)**		
R193	ERDS2TJ182	**ERDS2TJ182**	1/4W 1.8KΩ	(E)
		—	—	(EG) Deletion
R194	ERDS2TJ122	**ERDS2TJ122**	1/4W 1.2KΩ	(E)
		—	—	(EG) Deletion
R195	ERDS2TJ222	**ERDS2TJ222**	1/4W 2.2KΩ	(E)
		—	—	(EG) Deletion
R375, 376	ERDS2TJ102	—	1/4W 1KΩ	Deletion
R377, 378	ERDS2TJ223	—	1/4W 22KΩ	Deletion
R609, 610	ERDS2TJ100	**ERDS2TJ470**	1/4W 47Ω	
R613, 614	ERDS2TJ102	—	1/4W 1KΩ	Deletion
R615	ERDS2TJ184T	—	1/4W 180KΩ	Deletion
R616	ERDS2TJ154	—	1/4W 150KΩ	Deletion
R621, 622	ERD25FVJ180T	—	1/4W 18Ω	⚠ Deletion
R624	ERDS2TJ224T	—	1/4W 220KΩ	Deletion
R626	ERDS2TJ473	—	1/4W 47KΩ	Deletion
R643	ERDS2TJ154	—	1/4W 150KΩ	Deletion
R644	ERDS2TJ154	**ERDS2TJ473**	1/4W 47KΩ	
R645	ERDS2TJ183T	—	1/4W 18KΩ	Deletion
R678	—	**ERDS2TJ683**	1/4W 68KΩ	Addition
R680	—	**ERDS2TJ104**	1/4W 100KΩ	Addition
R705	ERDS1FVJ6R8T	**ERD2FCVJ4R7T**	1/4W 4.7Ω	⚠
CAPACITORS				
C108	ECBT1H100JC5	**ECBT1H100JC5**	50V 10pF	(E)
		ECBT1H8R2KC5	50V 8.2pF	(EG)
C375, 376	ECBT1H221KB5	—	50V 220pF	Deletion
C377, 378	ECBT1H821KB5	—	50V 820pF	Deletion
C609, 610	ECBT1H151KB5	**ECBA1H681KB5**	50V 680pF	
C613, 614	ECBA1H681KB5	—	50V 680pF	Deletion
C615	ECEA2AN2R2SB	**ECEA2AU100**	100V 10μF	
C618	ECEA2AU100	—	100V 10μF	Deletion
C621	ECEA2AU100	**ECEA2AN2R2SB**	100V 2.2μF	
C705, 706	ECA1VM472B	—	35V 4700μF	⚠ Deletion
C722	ECQE2104KF3	—	250V 0.1μF	Deletion
CABINET AND CHASSIS				
5	RGR0178B-K1	**RGR0178D-B1**	REAR PANEL	[M] (E)
		RGR0178D-A	REAR PANEL	[M] (EG)
10	RWJ1803150QK	—	FLAT CABLE (3P) (W301)	Deletion
11	RFKEAGX170EK	—	CONNECTOR ASS'Y (3P) (W302)	Deletion
13	RFKGAGX280EK	**RFKGAGX180EK**	FRONT PANEL ASS'Y	[M]
18	RGU1057-K	**RGU0991-K**	SELECTOR BUTTON	
32	XTBS3+8JFZ1	—	SCREW	Deletion
33	XTBS26+8J	—	SCREW	Deletion
PACKING MATERIAL				
P1	RPG2584	**RPG2583**	PACKING CASE	[M]
ACCESSORIES				
A1	RFKSAGX180E	**RFKSAGX180E**	INSTRUCTION MANUAL ASS'Y	[M] (E)
		RFKSAGX180EG	INSTRUCTION MANUAL ASS'Y	[M] (EG)

■ SCHEMATIC DIAGRAM (SA-GX280 Service Manual of pages 24~29.)

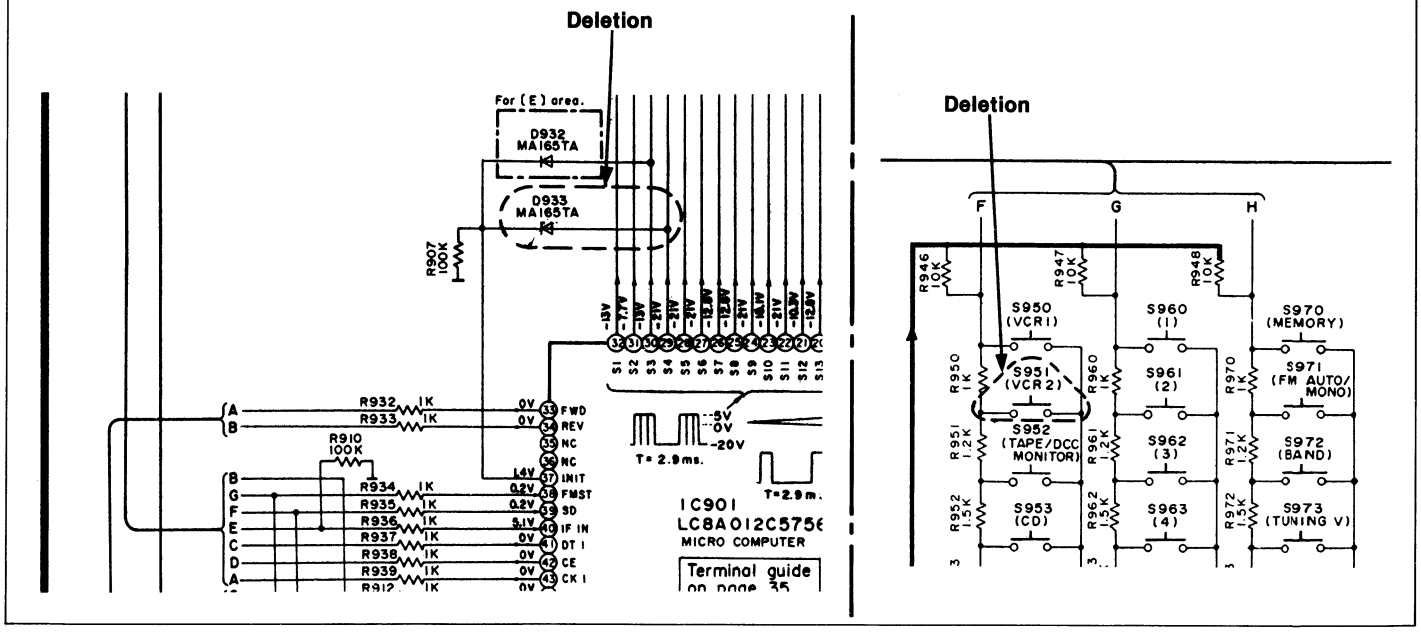


Notes: • For schematic diagram not specified in this Service Manual, refer to SA-GX280 (E) Order No. MD9505058C2.
• This schematic diagram may be modified at any time with the development of new technology.

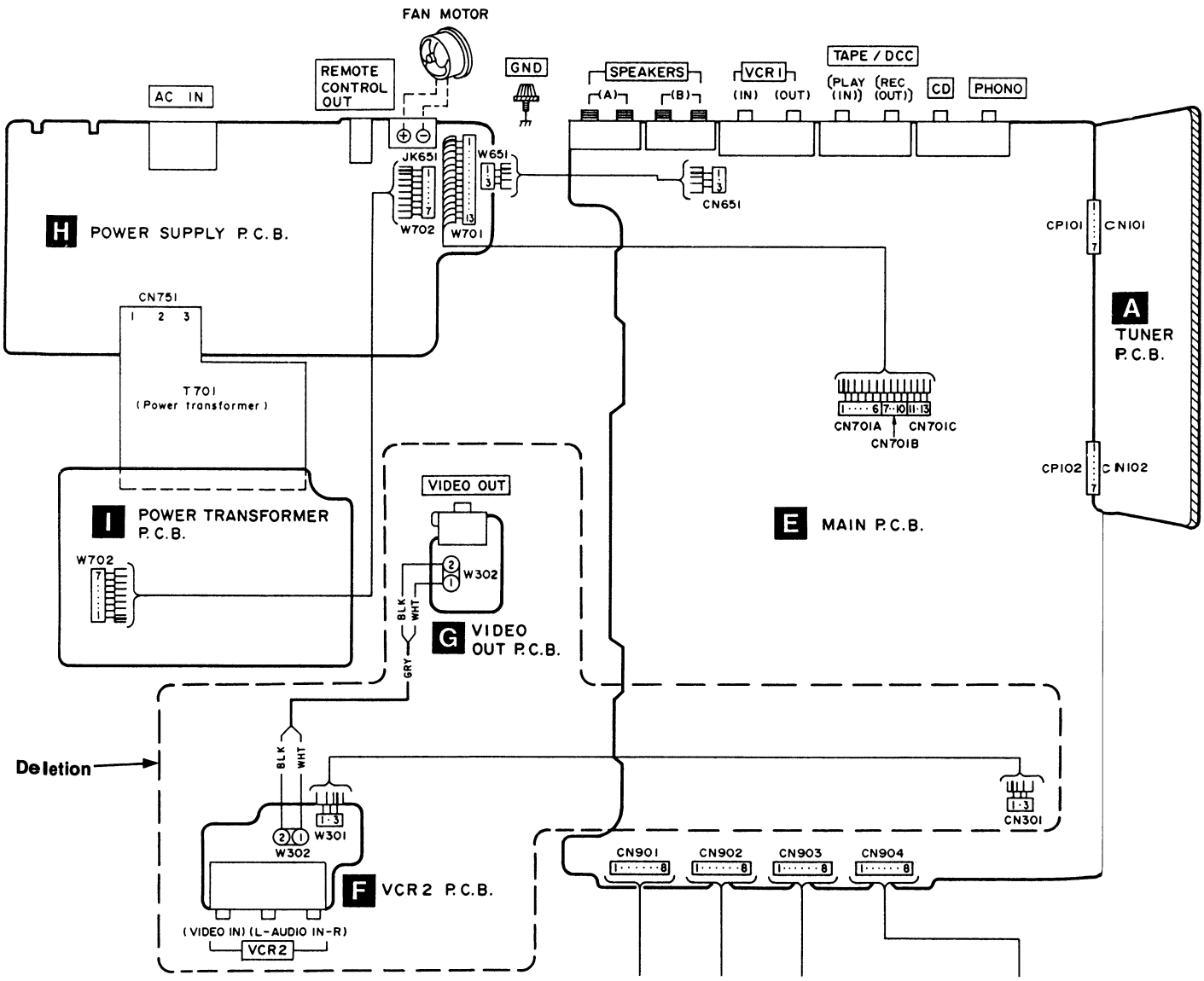



H POWER SUPPLY CIRCUIT (P.C.Board:on page 9)
CN651
W651
D651 MA165TA
FAN "OFF" : 0V
FAN "ON" : -0.6V
-15.5V
Q651,652,654,655
2SA1309ARTA
MOTOR DRIVE
FAN "OFF" : 0V
FAN "ON" : -5.5V
FAN "OFF" : 0V
FAN "ON" : -0.7V
C651 50V22
R689 27
R692 10K
Q651
D652 MTZJ5R6BTA
R684 15K
C654 6.3V220
R688 2.2K
R691 100K
Q652
Q655
Q654
R693 22K
R694 3.3M
C653 0.022
R683 10K
D653 MA165TA
R686 33K
R681 3.3K
R685 33K
R687 10K
C652 16V10
△R682 1/2W22
△Q653
2SB621ARTA
REGULATOR
JK651
M651
FAN MOTOR
FAN "OFF" : 0V
FAN "ON" : -0.3V
FAN "OFF" : 0V
FAN "ON" : -1.2V
FAN "OFF" : -15.5V
FAN "ON" : -15.4V
FAN "OFF" : -15.4V
FAN "ON" : -14.7V
FAN "OFF" : -0.7V
FAN "ON" : 0V
FAN "OFF" : 0V
FAN "ON" : -5V
R671 22K
R672 22K
R673 22K
R674 22K
R675 6.8K
JK601
C623 0.022
C624 0.022
C625 0.022
C626 0.022
L ch
R ch
L ch
R ch
A
B
SPEAKERS
JK602
(L6)
TP
(R6)
TP
C701 0.01
E601
R630 1W100
R628 1W100
R629 1W100
R627 1W100
△Q752
2SC3940AQSTA
REGULATOR
6.1V
8.9V
C891 3900P
JK406
REMOTE CONTROL OUT
△RL751
△C753 25V1000
D755 MA165TA
△D753 ISR35200TB
△D754 ISR35200TB
△T751
C752 0.01
△D752 ISR35200TB
△D751 ISR35200TB
△C751 400V1000P
B
A
CN701A
W701
CN701B
CN701C
B
A
△D756 MTZJ6R8CTA
C756 0.01
R754 1K
C757 16V47
6.8V
C759 25V22
5V
0V
4.7K
22K
Q751
UN421FTA
RELAY DRIVE
W702
△T701
CN713
CN714
CN712
CN711
CN710
230V
240V
CN751
△F1 T1.6A
△L701
△JK791
AC IN
(230-240V ---(E)
230V ----(EG)
50/60Hz
For (E) area.
For (EG) area.
I POWER TRANSFORMER CIRCUIT
(P.C.Board:on page 9)

B FL CIRCUIT (P.C.Board:on pages 8,9)

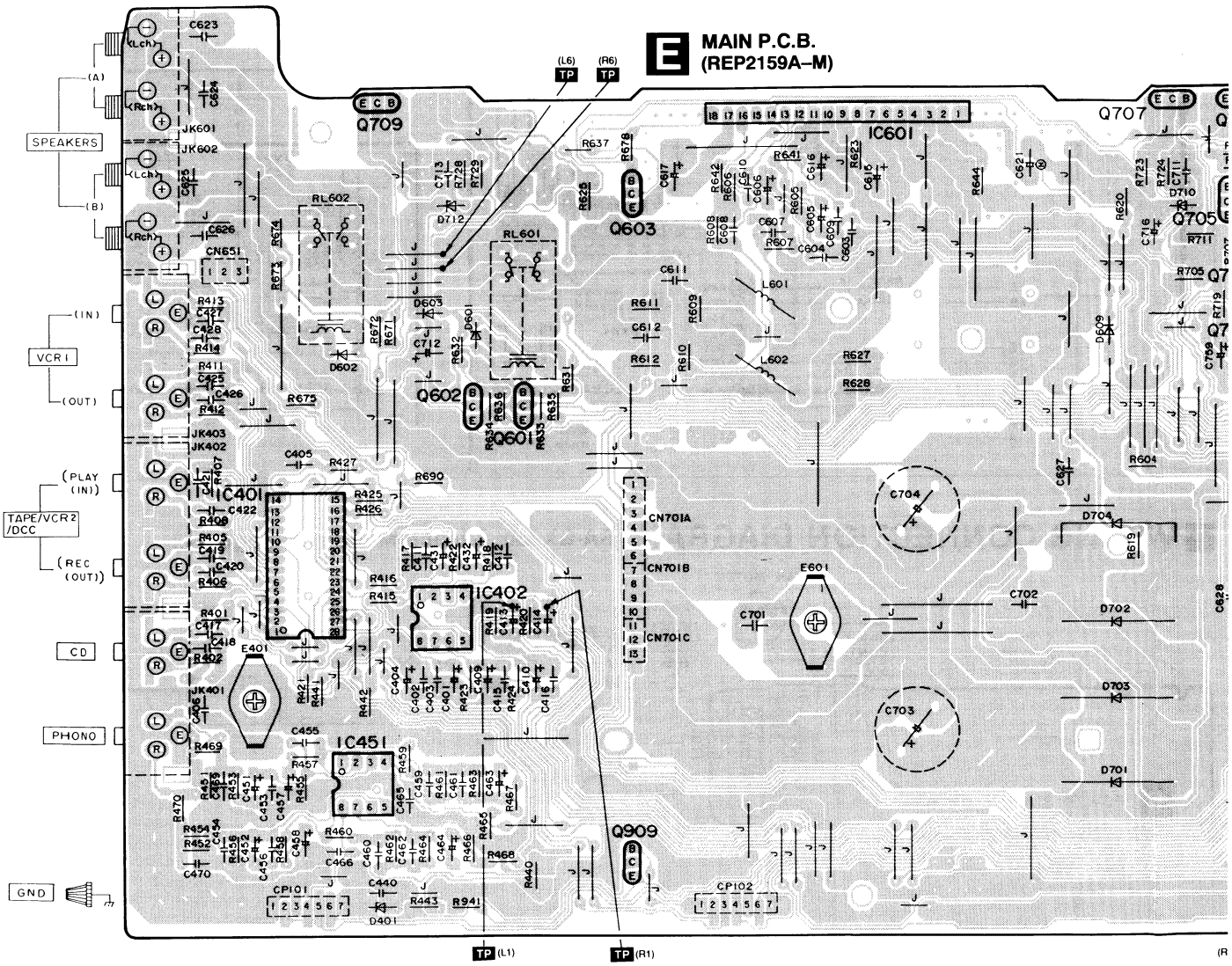


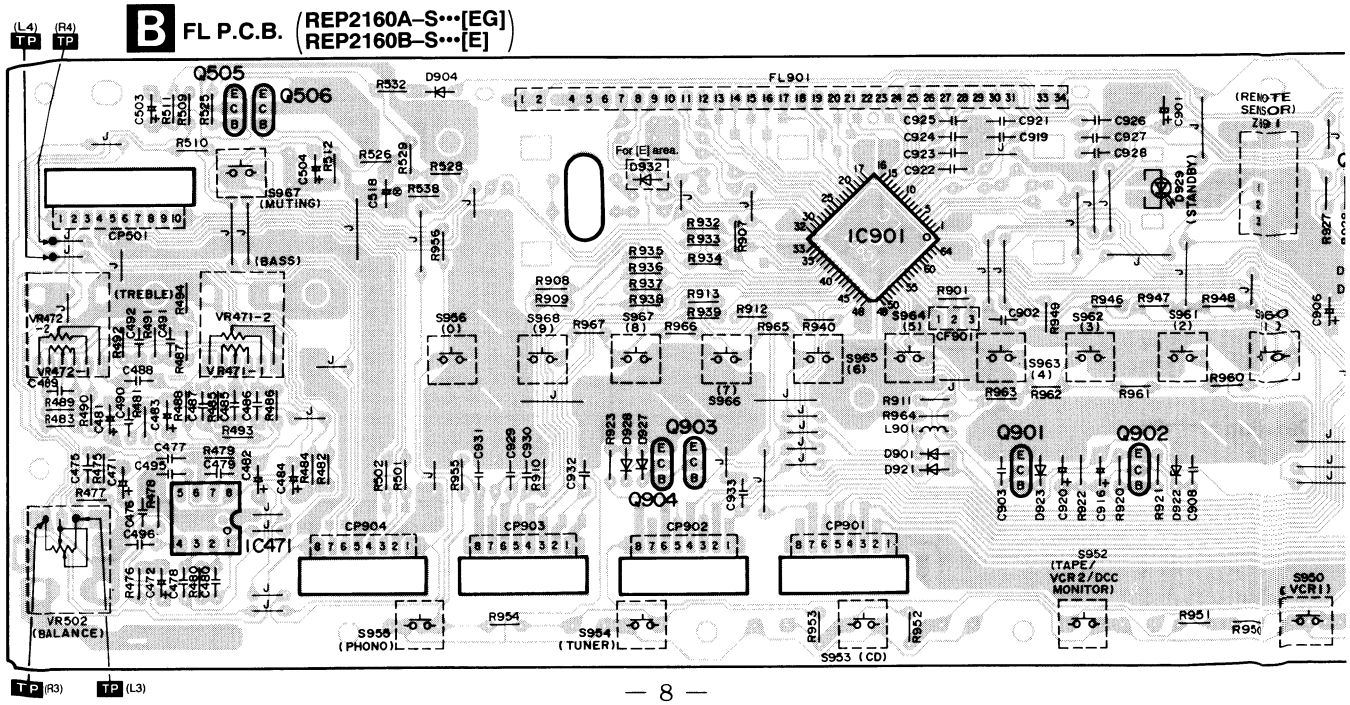
■ WIRING CONNECTION DIAGRAM (SA-GX280 Service Manual of page 34.)



■ PRINTED CIRCUIT BOARDS (SA-GX280 Service Manual of pages 30~33.)

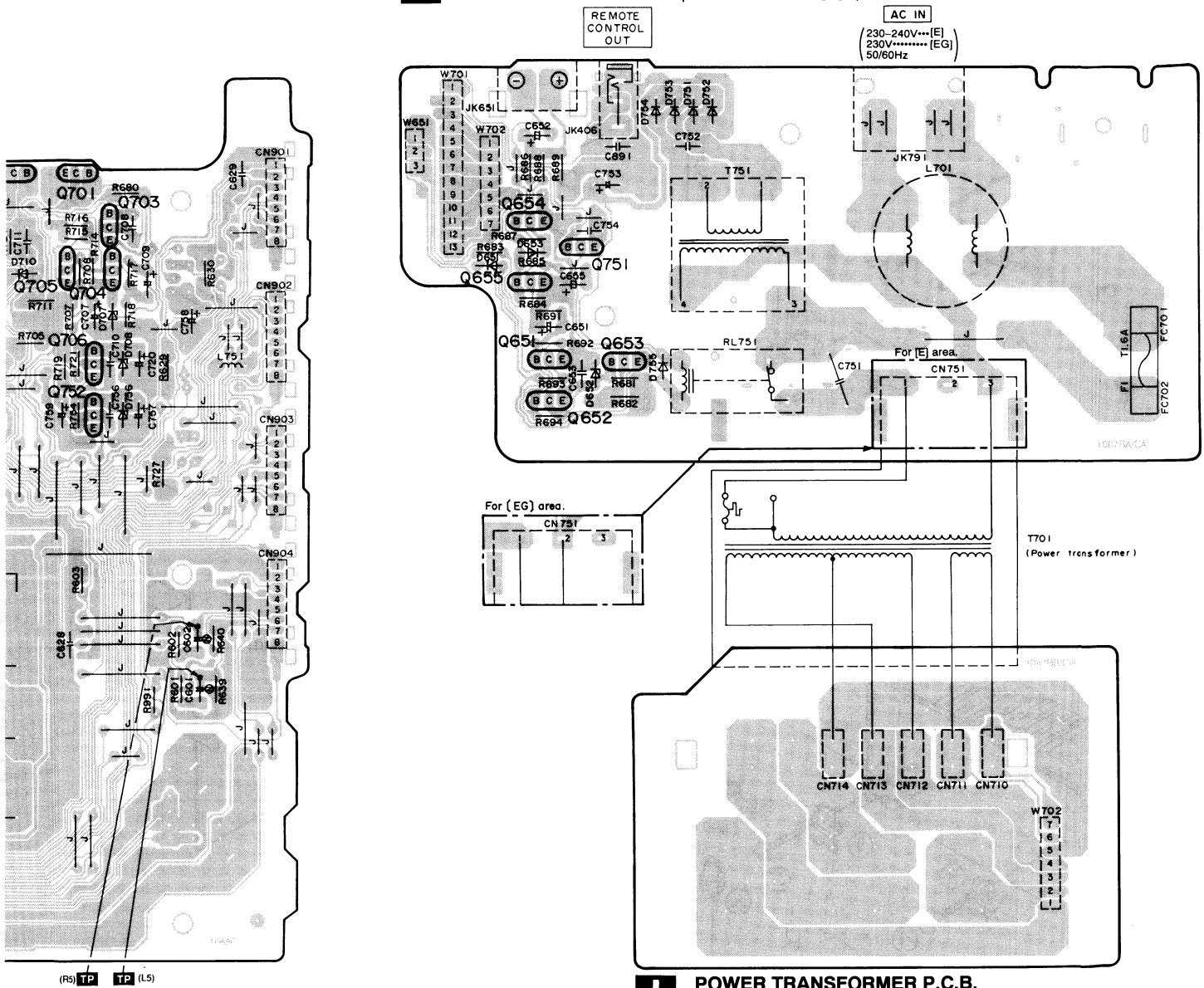
Notes: • For printed circuit boards not specified in this Service Manual, refer to SA-GX280 (E) Order No. MD9505058C2.
• This schematic diagram may be modified at any time with the development of new technology.



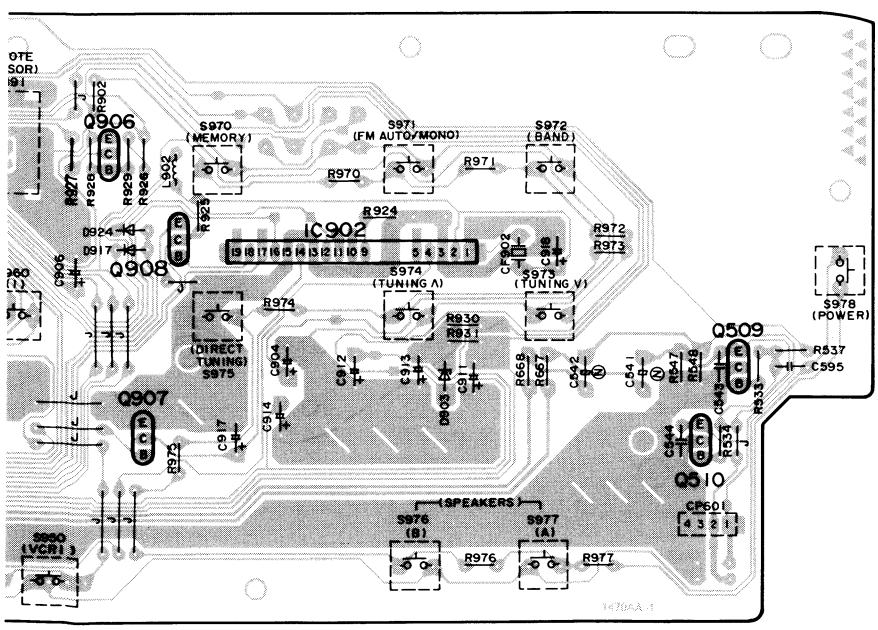


6 7 8 9 10

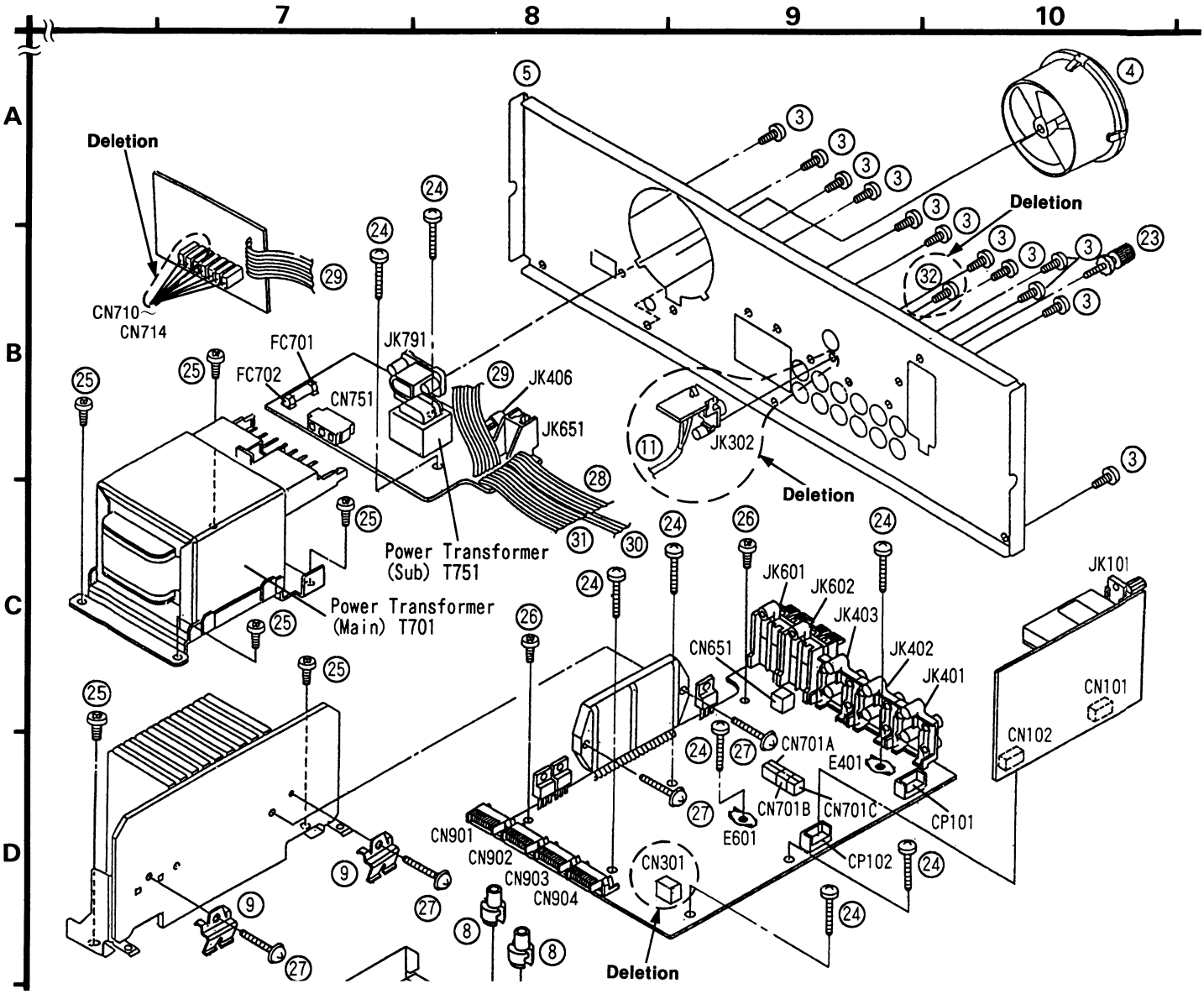
H POWER SUPPLY P.C.B. (REP1605F–P•••[EG] REP1605G–P•••[E])

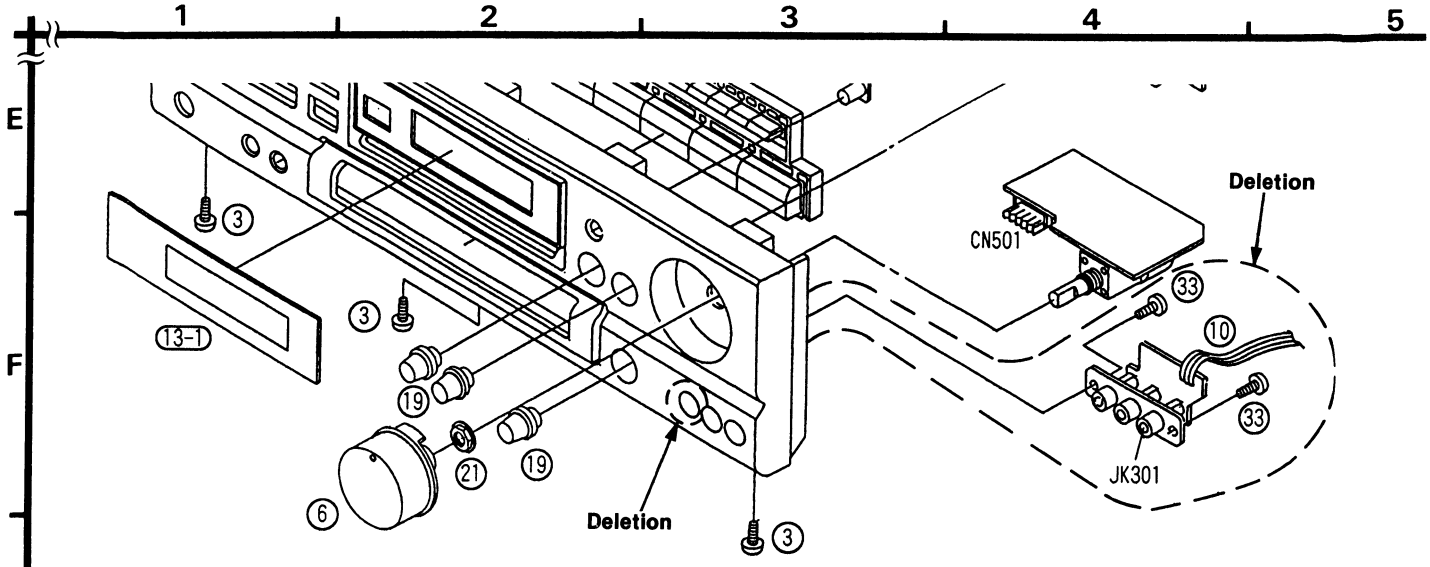


I POWER TRANSFORMER P.C.B. (REP1605F–P•••[EG] REP1605G–P••• [E])



■ CABINET PARTS LOCATION (SA-GX280 Service Manual of pages 36, 37.)





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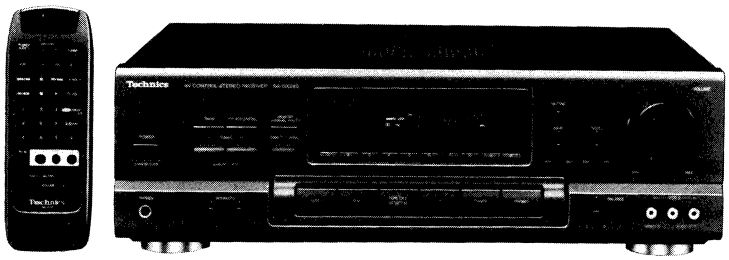
AV Control Stereo Receiver

Receiver

SA-GX280



Colour

(K) ... Black Type

Areas

Suffix for Model No.	Area	Colour
(E)	Europe.	(K)
(EG)	Germany and Italy.	

SPECIFICATIONS (DIN 45 500)

■ AMPLIFIER SECTION

Power output (at 240 V for (E) area.)
- **DIN 1 kHz (T.H.D. 1%)** 2 × 80 W (4 Ω)
- **40 Hz–20 kHz continuous power output both channels driven** 2 × 60 W (8Ω)

Total harmonic distortion
- **rated power at 40 Hz–20 kHz** 0.5% (8 Ω)
- **half power at 1 kHz** 0.03% (8 Ω)

Intermodulation distortion
- **rated power at 60 Hz: 7 kHz=4:1, SMPTE** 0.5% (8 Ω)

Power bandwidth
- **both channels driven, −3 dB** 10 Hz–40 kHz (8 Ω)

Damping factor 40 (8 Ω)

Input sensitivity and impedance
- **PHONO** 3 mV/47 kΩ
- **CD, VCR 1, VCR 2, TAPE/DCC** 200 mV/22 kΩ

S/N at rated power (8 Ω)
- **PHONO** 70 dB (IHF, A: 80 dB)
- **CD, VCR 1, VCR 2, TAPE/DCC** 80 dB (IHF, A: 90 dB)

Frequency response
- **PHONO** RIAA standard curve (30 Hz–15 kHz) ±0.8 dB
- **CD, VCR 1, VCR 2, TAPE/DCC** 10 Hz–40 kHz, ±3 dB

Tone controls
- **BASS** 50 Hz, +10 to −10 dB
- **TREBLE** 20 kHz, +10 to −10 dB

Output voltage
- **VCR 1 OUT, TAPE/DCC REC (OUT)** 200 mV

Channel balance (250 Hz–6.3 kHz) ±1 dB

Channel separation 55 dB

Headphones output level and impedance 430 mV/330 Ω

Load impedance
- **A or B** 4–16 Ω
- **A and B** 8–16 Ω

■ FM TUNER SECTION

Frequency range 87.50–108.00 MHz

Sensitivity
- **S/N 30 dB** 1.5 µV/75 Ω
- **S/N 26 dB** 1.3 µV/75 Ω
- **S/N 20 dB** 1.2 µV/75 Ω

IHF usable sensitivity (IHF '58) 1.5 µV/75 Ω

IHF 46 dB stereo quieting sensitivity 22 µV/75 Ω

Total harmonic distortion
- **MONO** 0.2%
- **STEREO** 0.3%

S/N
- **MONO** 60 dB (75 dB, IHF)
- **STEREO** 58 dB (71 dB, IHF)

Frequency response 20 Hz–15 kHz, +1 dB, −2 dB

Alternate channel selectivity
- **±400 kHz** 65 dB

Capture ratio 1.0 dB

Image rejection at 98 MHz 40 dB

IF rejection at 98 MHz 70 dB

Spurious response rejection at 98 MHz 70 dB

AM suppression 50 dB

Stereo separation
- **1 kHz** 40 dB

Carrier leak
- **19 kHz** −30 dB (−35 dB, IHF)
- **38 kHz** −50 dB (−55 dB, IHF)

Channel balance (250 Hz–6.3 kHz) ±1.5 dB

Limiting point 1.2 µV

Bandwidth
- **IF amplifier** 180 kHz
- **FM demodulator** 1000 kHz

Antenna terminal(s) 75 Ω (unbalanced)

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

■ AM TUNER SECTION

• For (E) area.

Frequency range	
MW	522−1611 kHz (9 kHz steps) 530−1620 kHz (10 kHz steps)
LW	144−288 kHz
Sensitivity	
MW	20 μV, 300 μV/m
LW	45 μV
Selectivity	
MW (at 999 kHz)	55 dB
LW (at 252 kHz)	55 dB
Image rejection	
MW (at 999 kHz)	40 dB
LW (at 252 kHz)	40 dB
IF rejection	
MW (at 999 kHz)	55 dB
LW (at 252 kHz)	55 dB

• For (EG) area.

Frequency range	522~1611 kHz (9 kHz steps) 530~1620 kHz (10 kHz steps)
Sensitivity (S/N 20 dB)	20 μV, 330 μV/m
Selectivity at 999 kHz	55 dB
Image rejection at 999 kHz	40 dB
IF rejection at 999 kHz	55 dB

■ GENERAL

Power consumption	160 W
Power supply	
[For (E) area.]	AC 50/60 Hz, 230−240 V
[For (EG) area.]	AC 50/60 Hz, 230 V
Dimensions (W × H × D)	430 × 136 × 305 mm
Weight	6.6 kg

■ REMOTE CONTROL TRANSMITTER

Control keys	35 keys
Dimensions (W × H × D)	62 × 22.3 × 175 mm
Weight (including batteries)	111 g (3.9 oz)
Power source	Two UM-4 (Panasonic R03/LR03 or equivalent)

Notes:

1. Design and specifications are subject to change without notice.
   Weight and dimensions are approximate.
2. Total harmonic distortions is measured by the digital spectrum analyzer.

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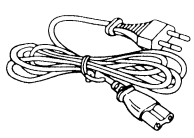
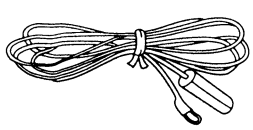
■ ACCESSORIES

AC power supply cord..... 1 pc.
[RJA0019-2K]

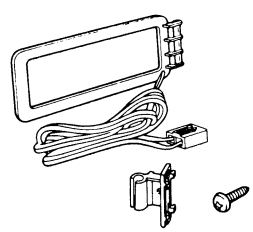


FM indoor antenna ..... 1 pc.
(SSA270M)

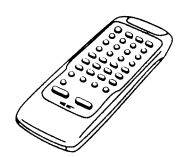


AM loop antenna set..... 1 pc.
(RSA0010)

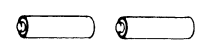
- AM antenna holder..... 1 pc.
  (RMN0244)
- Screw..... 1 pc.
  (XTN3+12AFZ)



Remote control transmitter (1)
(EUR643861)

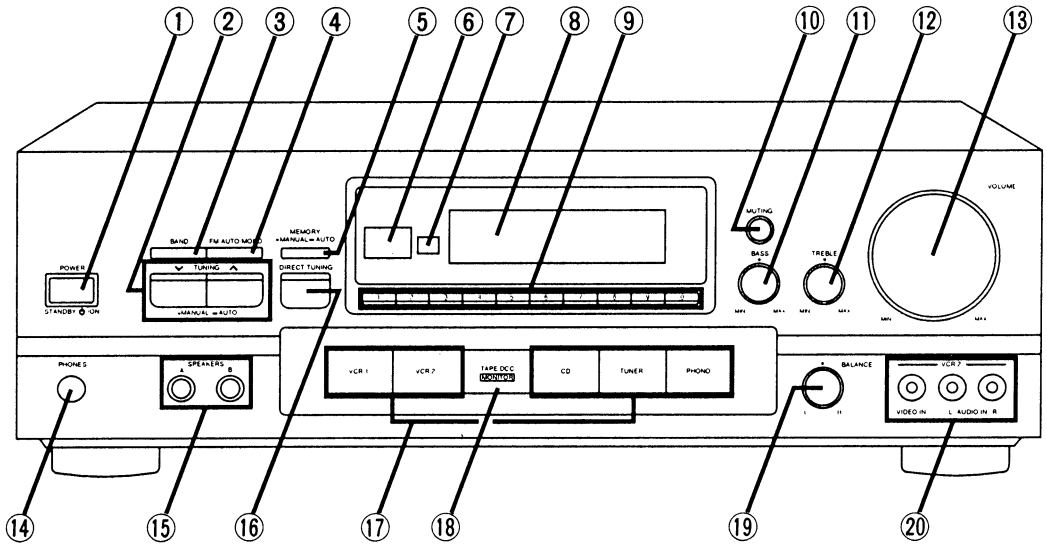


Batteries (2)
(UM-4, "AAA", R03)



Note: These are available on sale route.

■ FRONT PANEL CONTROLS

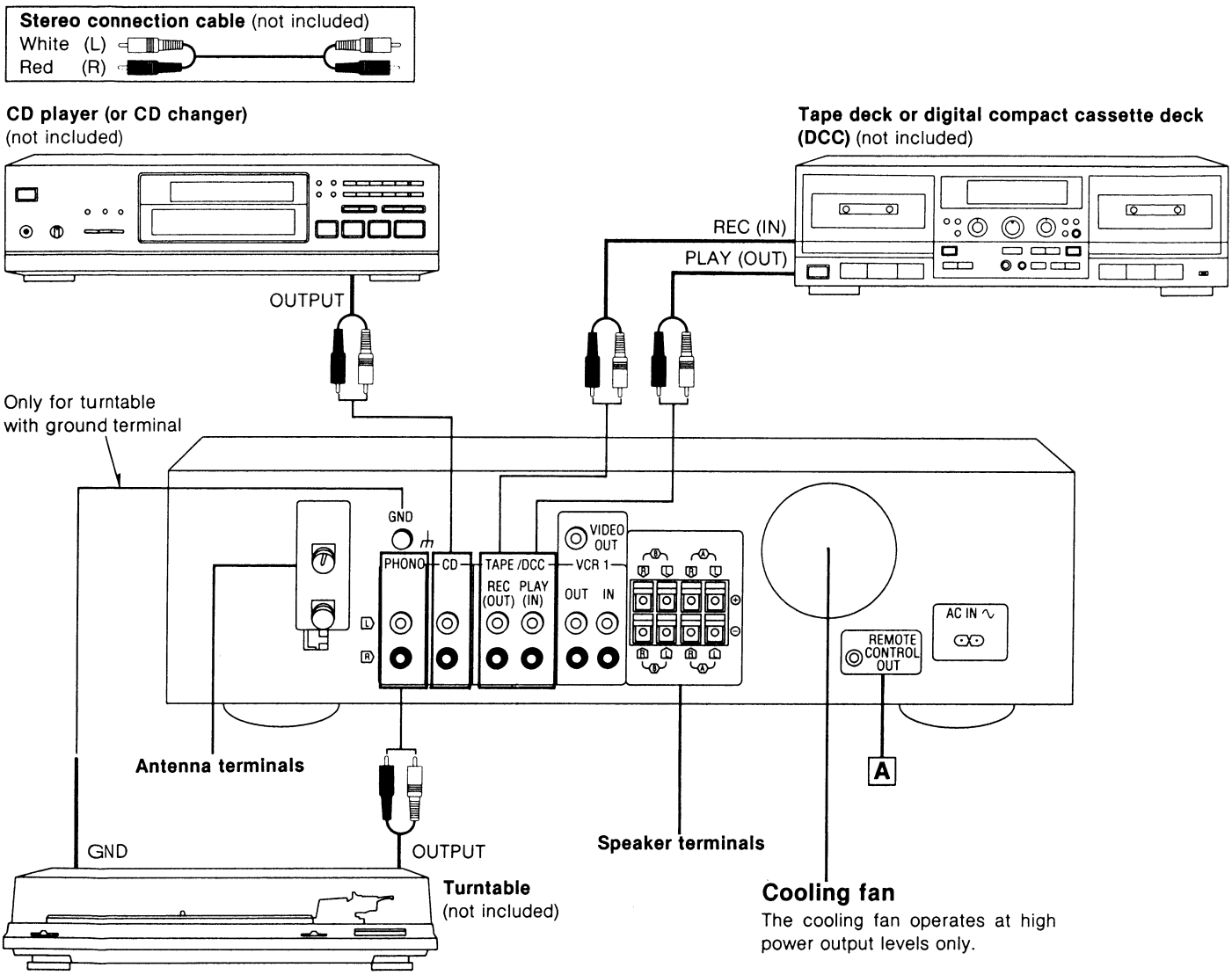


No.	*Name*
①	**Power "STANDBY ⏻/ON" switch (POWER, STANDBY ⏻/ON)** Press to switch the unit from on to standby mode or vice versa. In standby mode, the unit is still consuming a small amount of power.
②	**Tuning buttons (TUNING)**
③	**Band select button (BAND)**
④	**FM mode select button (FM AUTO/MONO)**
⑤	**Memory button (MEMORY)**
⑥	**Remote control signal receptor (SENSOR)**
⑦	**"STANDBY" indicator** When the unit is connected to the AC mains supply, this indicator lights up in standby mode and goes out when the unit is turned on.
⑧	**Display**
⑨	**Numeric buttons (1 – 0)**
⑩	**Muting button (MUTING)**

No.	*Name*
⑪	**Bass control (BASS)**
⑫	**Treble control (TREBLE)**
⑬	**Volume control (VOLUME)**
⑭	**Headphone jack (PHONES)**
⑮	**Speaker select buttons (SPEAKERS)**
⑯	**Direct tuning button (DIRECT TUNING)**
⑰	**Input select buttons**
⑱	**Tape/DCC monitor button (TAPE/DCC [MONITOR])**
⑲	**Balance control (BALANCE)**
⑳	**VCR 2 input terminals (VCR 2)**

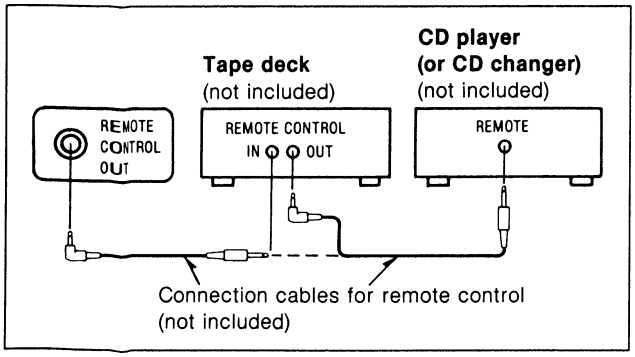
■ EQUIPMENT CONNECTIONS

Connecting audio equipment



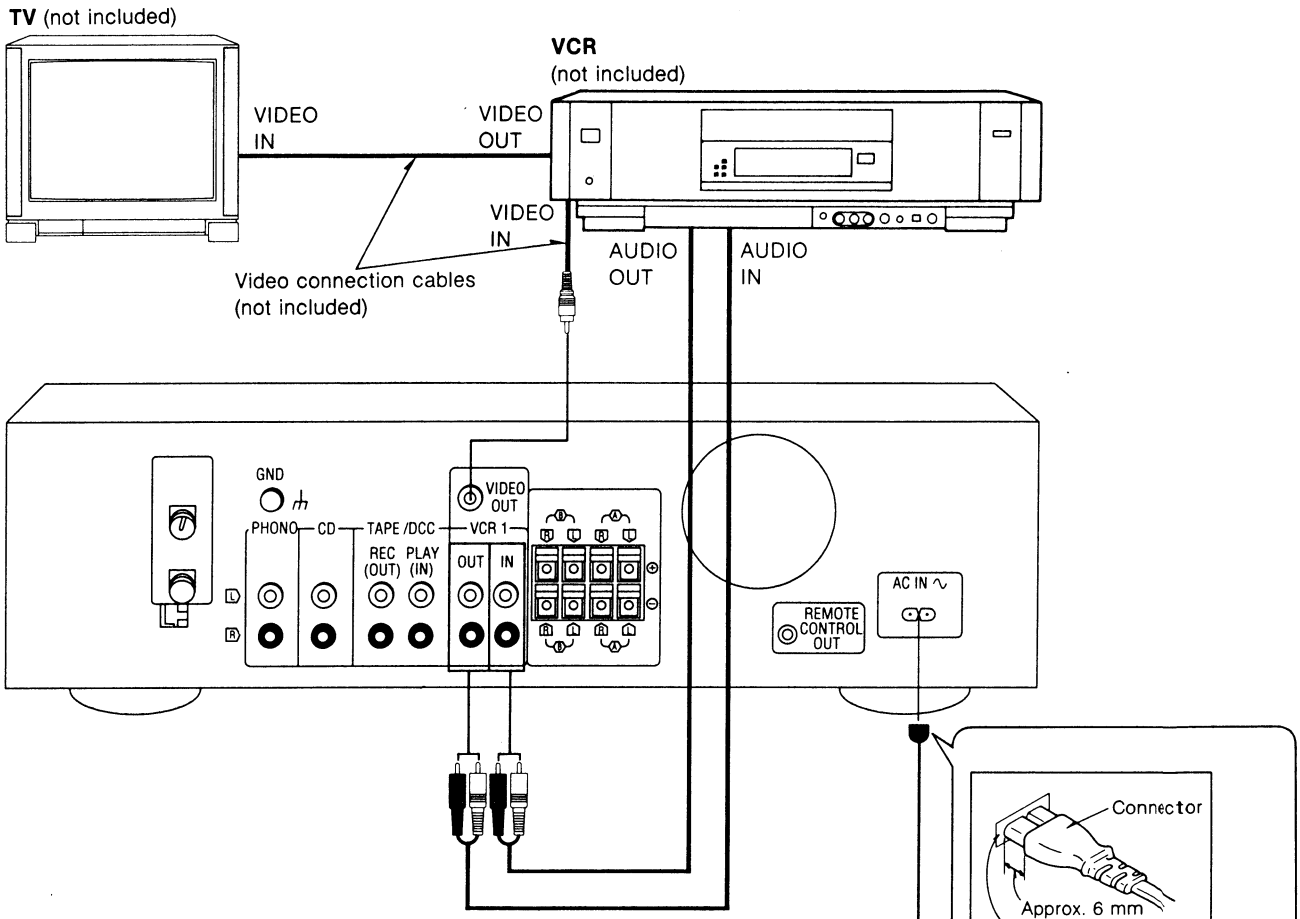
A "REMOTE CONTROL OUT" terminal

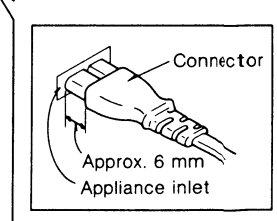
Connect the connection cable for the remote control to a Technics tape deck and/or CD player (or CD changer) which has the appropriate remote control terminal as shown below. If a tape deck is not being used, the CD player (or CD changer) can be connected directly (dotted line).



For a CD player (or CD changer) with a remote control sensor the above connection is not necessary.

Connecting video equipment





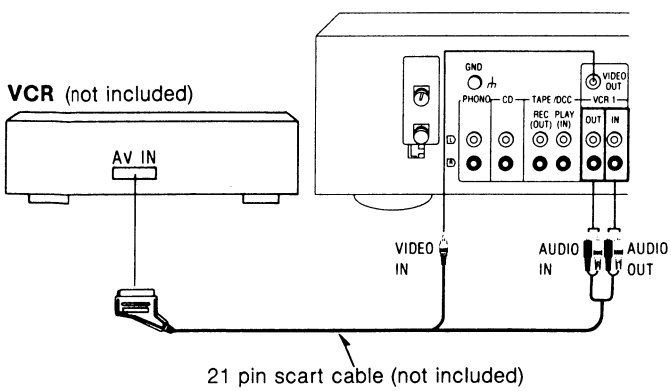
Even when the connector is perfectly inserted, the front part of the connector juts out as shown in the drawing. However there is no problem using the unit.

AC power supply cord (included)

Connect this cord after all other cables and cords are connected.

Household AC outlet

To connect a video deck with 21 pin scart terminal



21 pin scart cable (not included)

■ PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are " shorted", or if speaker systems with an impedance less than the indicated rated impedance of the amplifier are used.

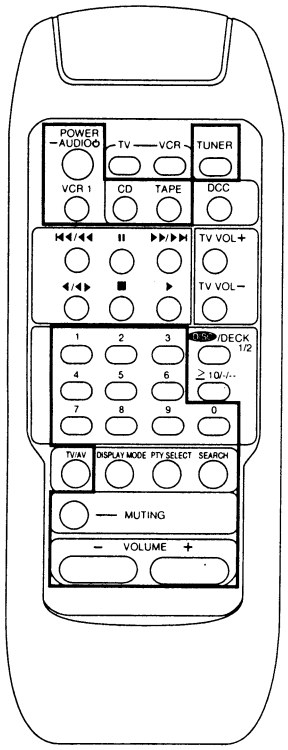
If this occurs, follow the procedure outlined below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note:

When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

■ REMOTE CONTROL OPERATION



To listen to radio broadcasts

TUNER ➡ 1 2 3 / 4 5 6 / 7 8 9 0

Specify the preset channel using the numeric button(s).

(Example: Channel 12)

1 ➡ 2

Within 2 sec.

Basic operations

To turn the unit ON/OFF	POWER −AUDIO⏻ (Touch only)
To select an input source	TUNER TAPE CD VCR 1 ***Note*** 1. VCR 2 and PHONO can not be selected by this remote control. 2. When selecting DCC, press TAPE.
To turn the tape monitor function ON	While recording is being made. TAPE
(While listening to RDS broadcasts) **To change the display mode**	DISPLAY MODE This display mode changes each time the button is pressed.
(While listening to RDS broadcasts) **To select the desired program type**	PTY SELECT The PTY display changes each time the button is pressed.
(While listening to RDS broadcasts) **To start PTY search**	SEARCH
To mute the sound level	MUTING Press once more to return to the original volume.
To adjust the volume level	− VOLUME +
If your unit is equipped with the Technics Remote Control System	
To turn the system OFF	POWER −AUDIO⏻ Press for approx. 2 seconds. (This may not be possible with some models.)

■ BEFORE REPAIR AND ADJUSTMENT

Disconnect AC power, Discharge both Power Supply Capacitors C703 and C704 (56V 4700μF), C705 and C706 (35V 4700μF) through a 10Ω, 5W resistor to ground.
DO NOT SHORT-CIRCUIT DIRECTLY (with a screwdriver blade, for instance), as this may distroy solid state devices.
After repairs are completed, restore power gradually using a variac, to avoid overcurrent.
Current consumption at 50Hz/60Hz in NO SIGNAL mode should be shown below with respect to supply voltage AC 230V/240 V.

Power supply voltage	AC 230V		AC 240V	
Consumed current 50/60Hz	50Hz	120~350mA	50Hz	130~380mA
	60Hz	96~280mA	60Hz	104~304mA

■ OPERATION CHECKS AND MAIN COMPONENT REPLACEMENT PROCEDURE

NOTE

1. **This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.**
2. **For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.**
3. **Select items from the following index when checks or replacement are required.**
4. **Illustrated screws are equivalent to actual size.**
5. **Refer the parts No. on the page of "Main Component Replacement Procedures", if necessary.**

• Contents

•Checking Procedure for each P.C.B. Page.

1.Checking for the FL P.C.B. and tuner P.C.B.. ..... 7.

2.Checking for the main P.C.B.. ..... 8,9.

•Main Component Replacement Procedures

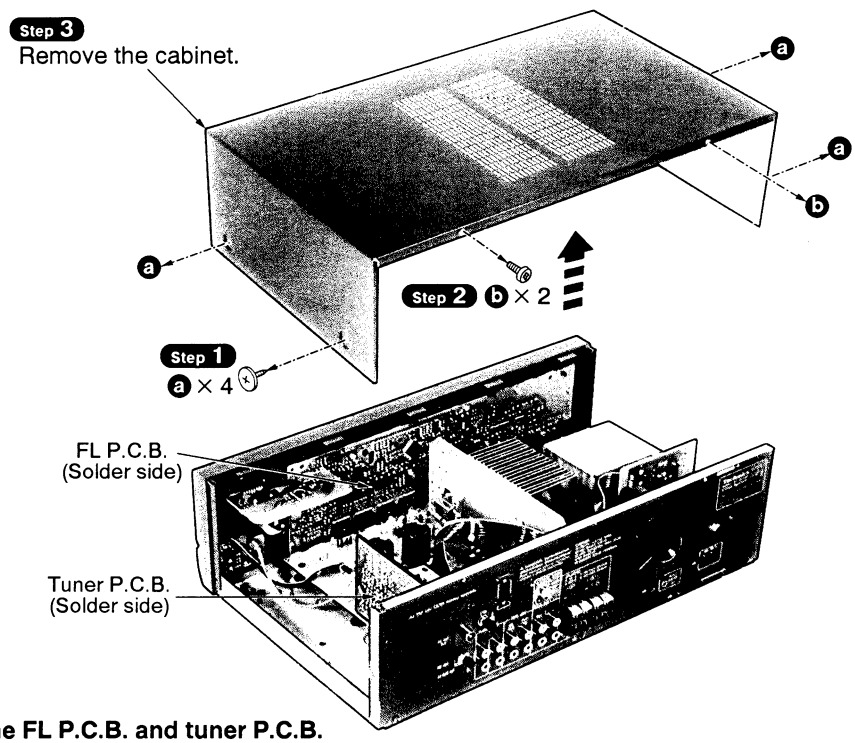
1.Replacement for the foot. ..... 10.

2.Replacement for the power IC and regulator transistor. ..... 10~12.

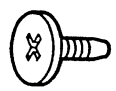
3.Replacement for the fan motor. ..... 12.

■ Checking Procedure for each P.C.B.

1. Checking for the FL P.C.B. and tuner P.C.B.



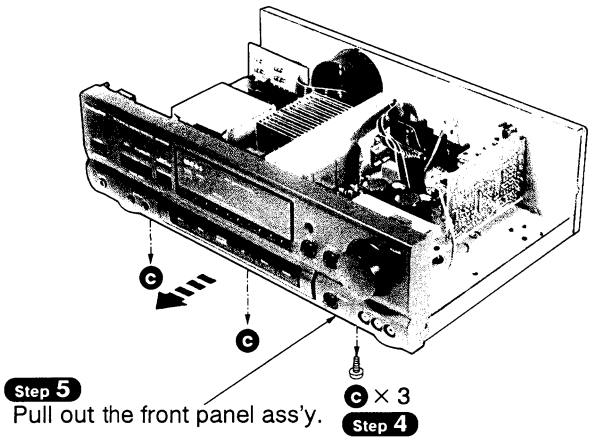
• **Check the FL P.C.B. and tuner P.C.B. as shown above.**

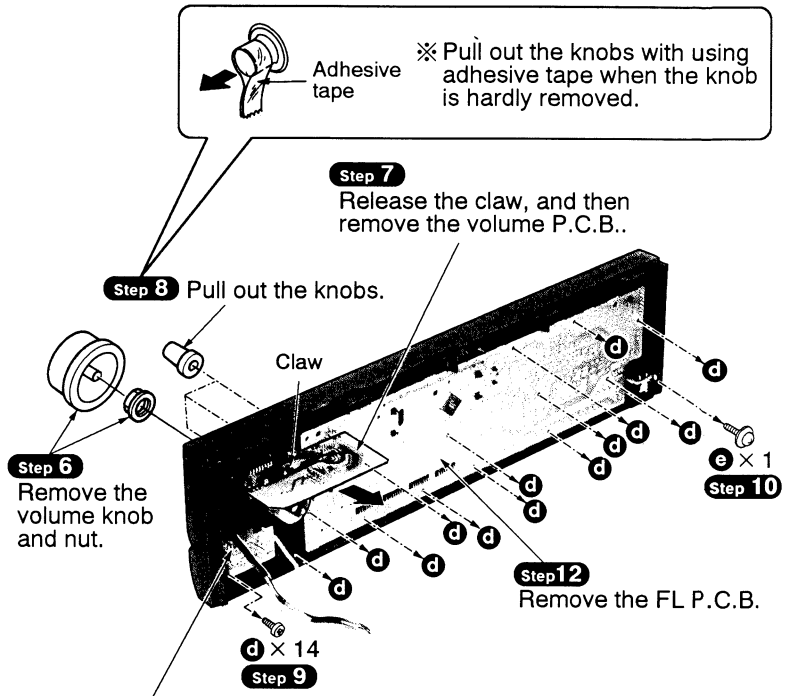


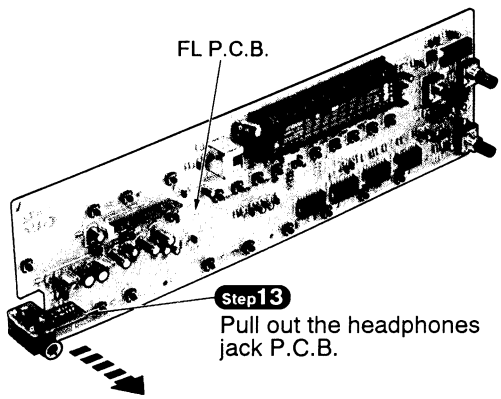
[SNE2129–1](Black)

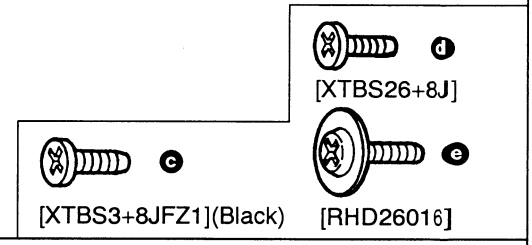
[XTBS3+8JF21] (Black)

To remove each P.C.B.

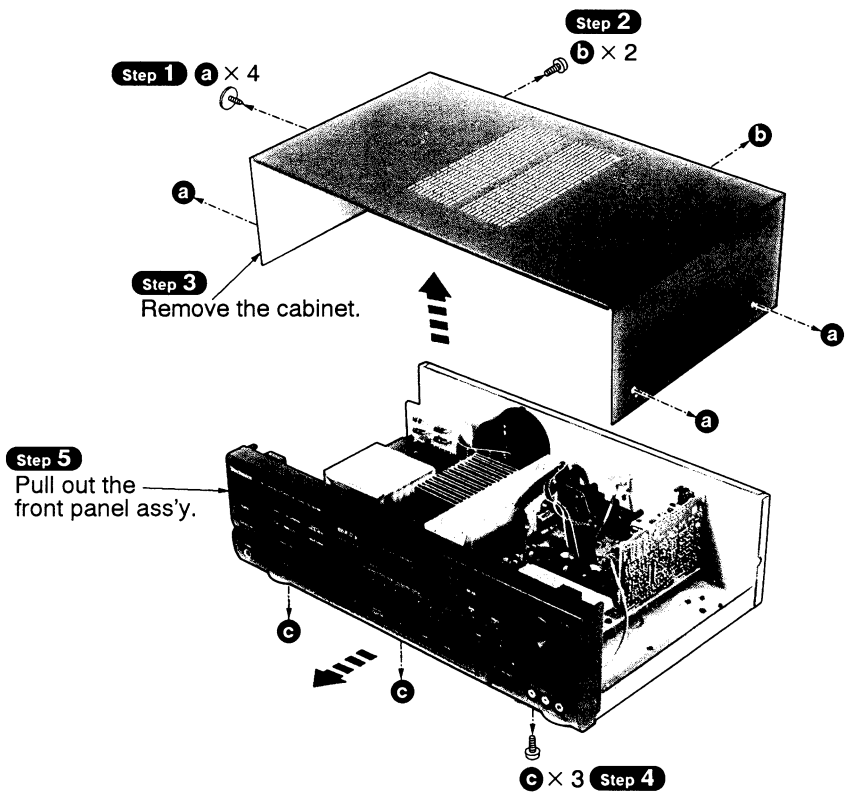






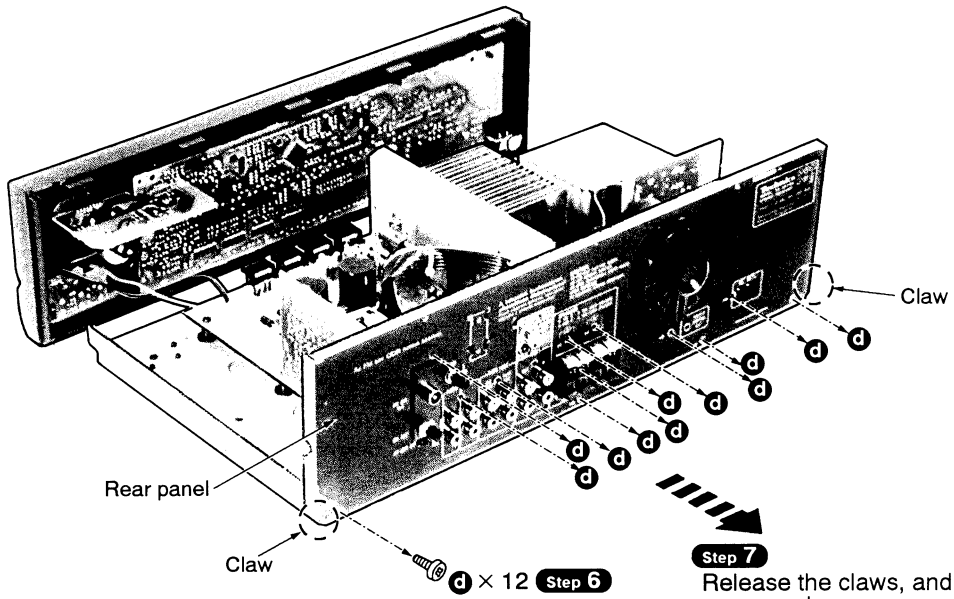


2. Checking for the main P.C.B.

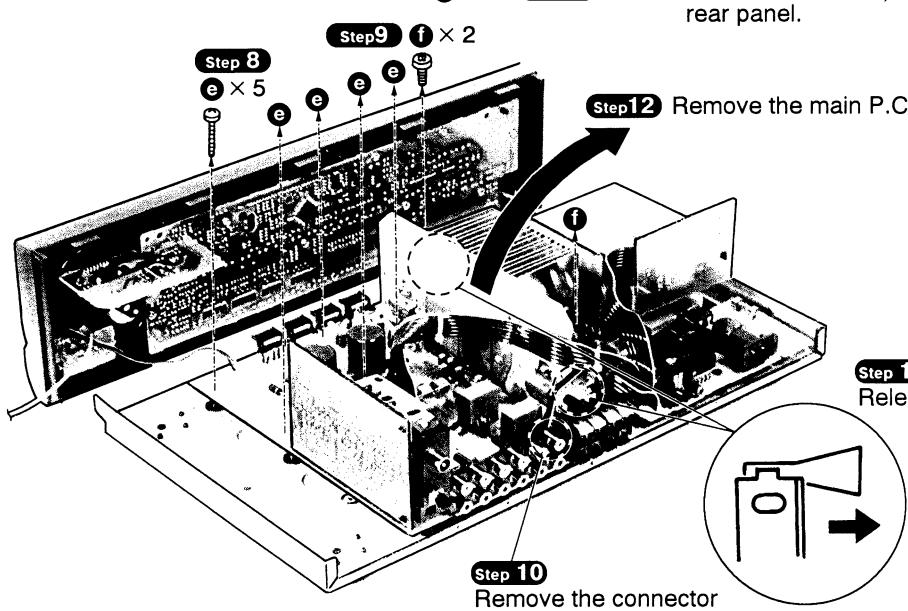


[SNE21 29–1](Black)

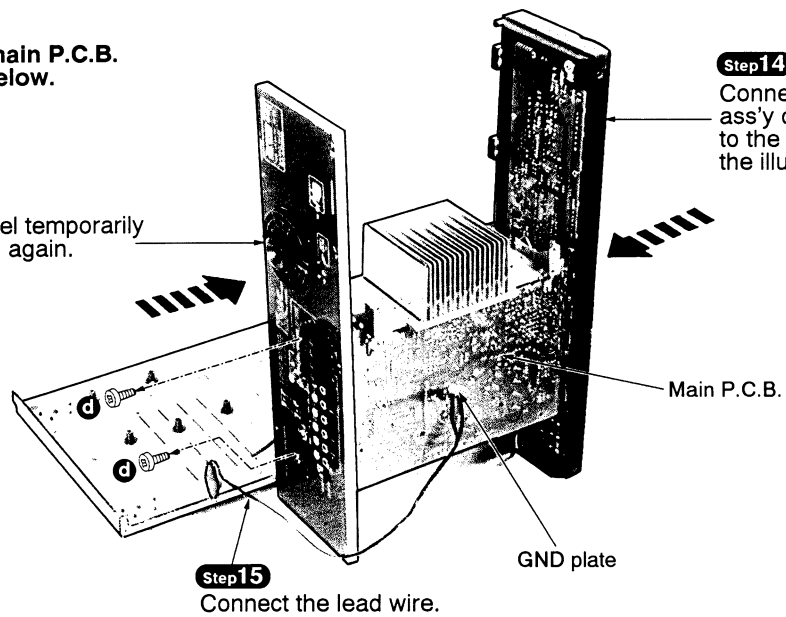
[XTBS3+8JFZ1](Black)



Step 7
Release the claws, and then remove the rear panel.



• Check the main P.C.B. as shown below.


Step14
Connect the front panel ass'y of the P.C.B. connectors to the main P.C.B. and set it as the illustration left.
Step13
Install the rear panel temporarily on the main P.C.B. again.
Main P.C.B.
GND plate
Step15
Connect the lead wire.

d
[XTBS3+8JFZ1](Black)

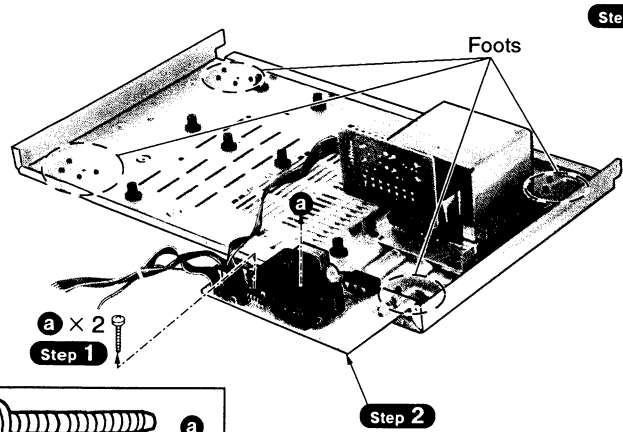
e
[XTB3+20JFZ](Black)

f
[XTB3+8JFZ](Black)

■ Main Component Replacement Procedures

1. Replacement of the foot

• Follow the Step 1 ~ Step12 in item 2 on checking procedure for each P.C.B. on pages 8 and 9.

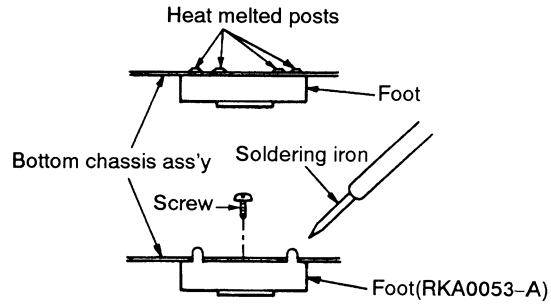


[XTB3+20JFZ](Black)

Step 2 Remove the power supply P.C.B.

Step 3 Remove the 4 heat melted posts on the Bottom chassis ass'y with a pair of nippers or similar tool.

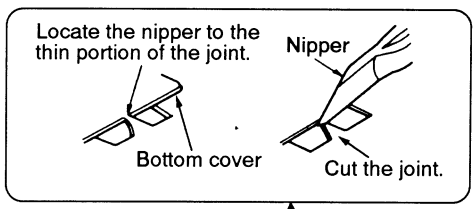
Step 4 To replace the foot(RKA0053–A) on the Bottom chassis ass'y melt the 4 posts with a soldering iron or install it with a screw (XTB3+6J).

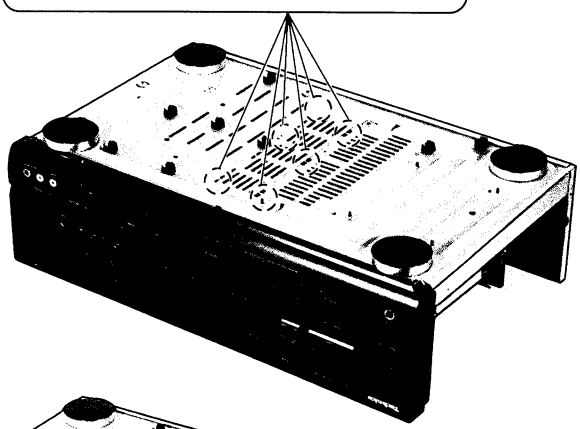


2. Replacement for the power IC and regulator transistor

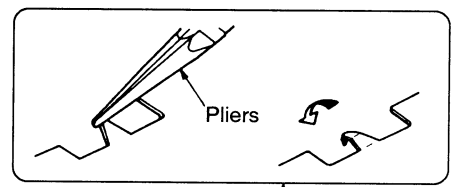
• Follow the Step 1 ~ Step 3 in item 1 on checking procedure for each P.C.B. on page 7.

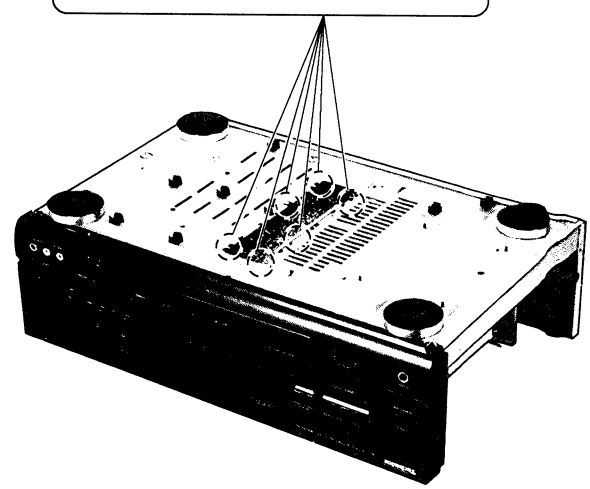
Step 1 Cut the joints as shown below.(6 portions)

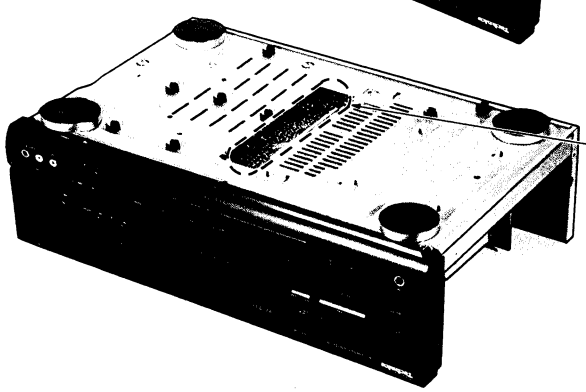




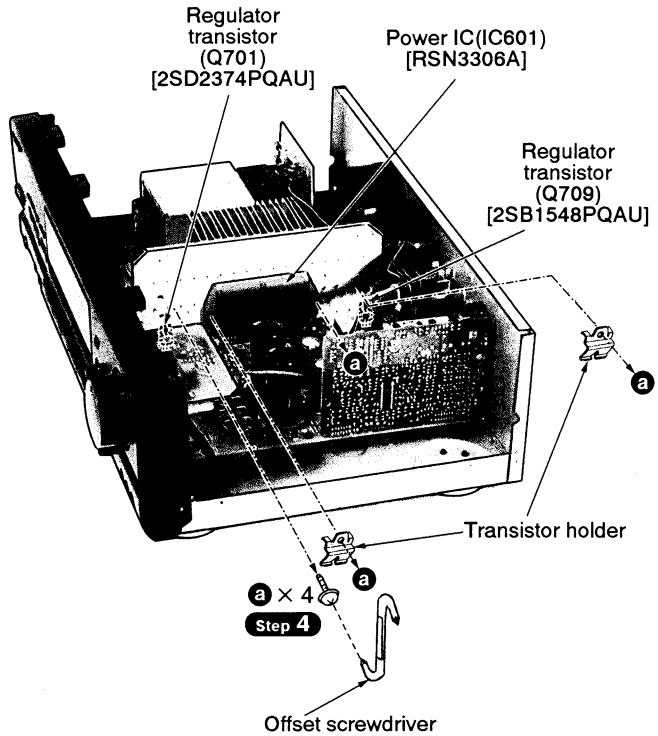
Step 2 Fold the joints.(6 portions)



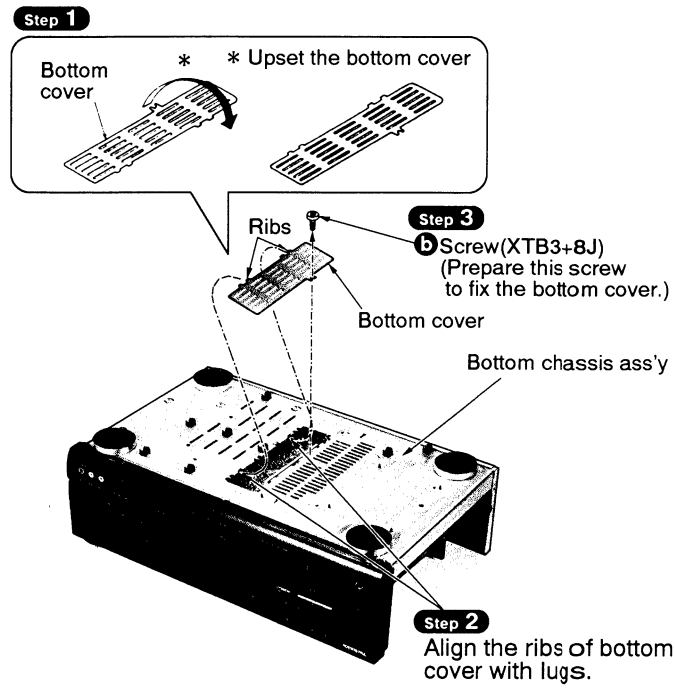


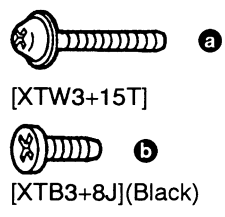


Step 3 Unsolder the terminals of power IC and regulator transistor.



Installation of the bottom cover after replacement

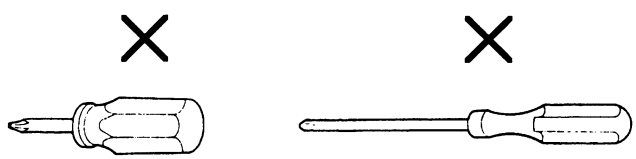




CAUTION

1. After replceing the power IC or regulator transistor,apply a sufficient quantity of compound grease (RFKX0002) between the heat sink and the power IC or regulator transistor (Radiation of power IC).
2. Tighten enough the screws (a) after replacing the power IC and regulator transisitor. Otherwise, the heat rabiation works little.
3. When installing or removing the power IC or transistor holder, be sure to use an offset screwdriver.

- A long straight screwdriver canniot be used for removal or mounting since its long grip interferes wiht the neighboring P.C.B.(See Fig.1)
- A short straight screwdriver may be used for removal, but cannot be used for mounting because the limited space in the unit will not allow sufficient tightening torque. (See Fig.2)



A short straight screwdriver A long straight screwdriver

Fig.2

- Insufficient tightening will cause poor heat dissipation from the power IC and regulator transistor and, in the worst case, may lead their thermal breakdown. (See Fig.2)

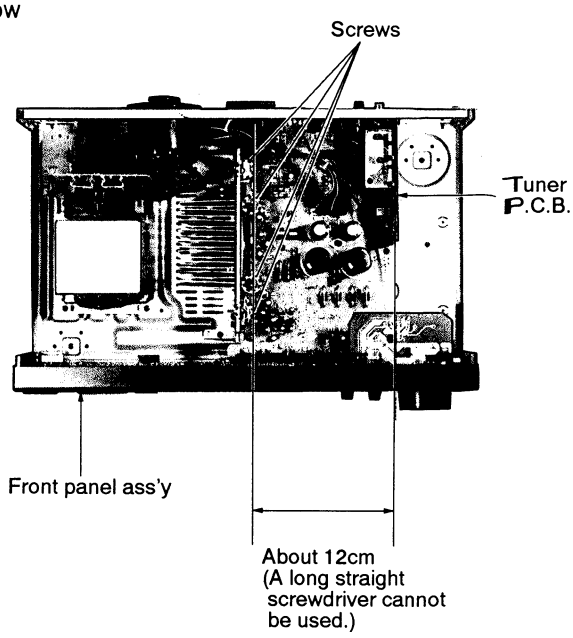
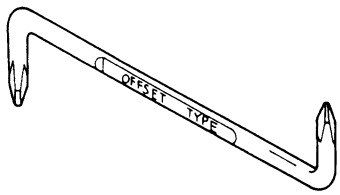


Fig.1

——OFFSET SCREWDRIVER——

• The PROTO offset screwdriver No.34-¼ is recommended for use in the application above.



No.	⊕	← L →
34¼	1 & 2	4¾″

• The address of PROTO International Sales is as follows.

International Sales

International Sales Office
Stanley-Proto Industrial Tools
14117 Industrial Park Blvd.
Covington, GA 30209 U.S.A.
Fax: 706-786-4387
Phone: 706-787-3800

Australia, New Zealand & South Pacific
Stanley-Proto Industrial Tools
P.O.Box 10
400 Whitehorse Road
Nunrweding 3131
Victoria, Australia
Fax: 61-3-894-1173
Phone: 61-3-878-9244

Singapore, Indonesia, Philippines, Korea, Hong Kong, Malaysia, China.
Stanley-Proto Asia Pacific
12 Gul Drive
Singapore 2262
Fax: 65-861-3206
Phone: 65-862-0883

Thailand
Stanley-Proto Thailand Ltd.
1017 Moo 13 Bangnatrad Highway, Tambol Bankaew
Amphur Bangplee
Samutprakarn, Thailand
Fax: 66-2-316-6071
Phone: 66-2-316-8655

Japan
Stanley Works Japan
2-7-16 Hyakunin-Cho
Shinjuku-ku
Tokyo 160 Japan
Fax: 81-3-3360-8456
Phone: 81-3-3360-8458

Mexico
Herramientas Stanley S.A. DE C.V.
Apartado Postal 675
72030 Puebla, Pue, Mexico
Fax: 52-22-494-4880
Phone: 52-22-495-300

South & Central America, Puerto Rico, The Caribbian
Stanley Inter-America
2101 N.W. 84th Ave.
Miami, Florida 33122
Fax: 305-594-4261
Phone: 305-591-3828

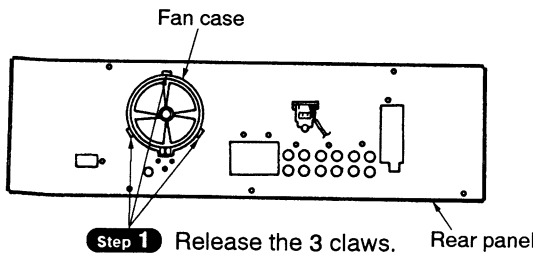
Europe
Stanley-Proto Europe
Woodside, Sheffield
539PD
England
Fax: 44-742-739-038
Phone: 44-742-768-888

Canada
Stanley-Proto Canada
1100 Corporate Drive
Burlington, Ontario
Canada, L7L 5R6
Fax: 416-335-0075
Phone: 416-335-0075

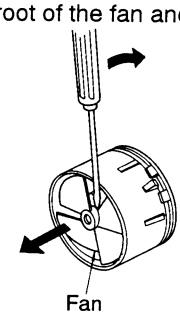
Middle East, Mediterranean & Africa
Stanley-MEMA
Cory House The Ring
Bracknell Berkshire
RG 12 1A2
England
Fax: 44-344-485-526
Phone: 44-344-51813

3. Replacement for the fan motor

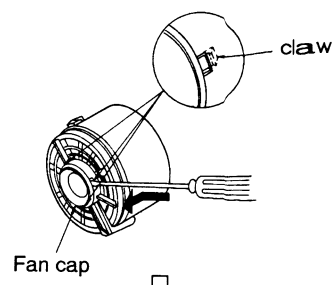
• Follow the Step 1 ~ Step 9 in item 2 on checking procedure for each P.C.B. on pages 8 and 9.



Step 2 Put a screwdriver at the root of the fan and remove it.

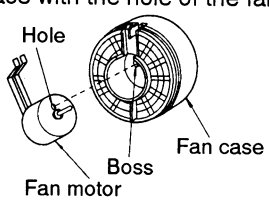


Step 3 Remove the fan cap.

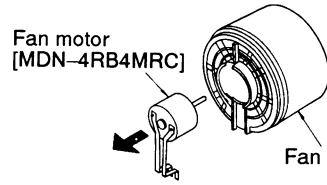


NOTE

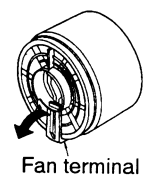
When replacing the fan motor, align the boss of the fan case with the hole of the fan motor.



Step 5 Remove the fan motor.



Step 4 Remove the fan terminal cap.

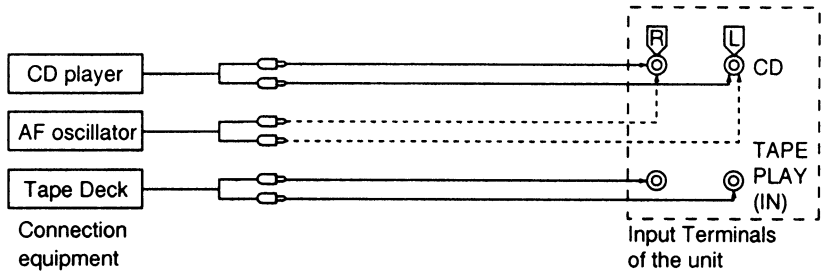


■ TROUBLESHOOTING

This unit has test points on each circuit board block for use in troubleshooting.

CONNECTION

Connect either a CD player, tape deck or AF oscillator to the input terminals of the unit.



REQUIRED ITEMS

① Testing with a CD player ———— Test deck (SZZP1054C/first pragram, 1kHz, 0dB)
② Testing with a tape deck ———— Test tape (QZZCLA/315Hz, 0dB)
③ Testing with a AF oscillator ———— Set the output at 500Hz, 200mV
④ Oscilloscope (min. 10MHz) ---------- To measure the output waveform at the test points.

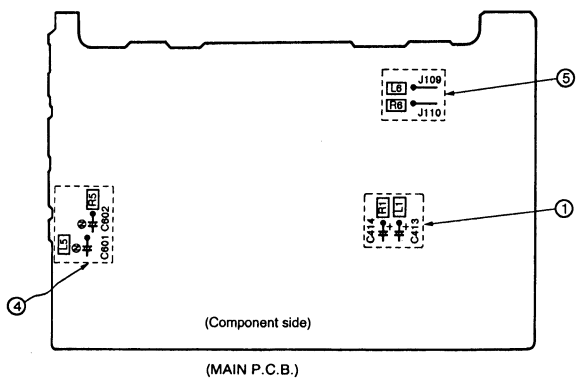
TEST PROCEDURE FOR AMPLIFIER CIRCUIT

When the CD player AF oscillator is connected:	When the tape deck is connected:
Power on the unit. Set the input selector button of the unit to the "CD" position. Set the Speaker ON/OFF button of the unit to the SPEAKERS "ON" position.	Power on the unit. Set the input selector button of the unit to the "TAPE MONITOR" position. Set the Speaker ON/OFF button of the unit to the SPEAKERS "ON" position.
Run the CD player or Run the AF oscillator	Run the tape deck
(SZZP1056C/first program 1 kHz, 0dB)	(QZZCLA 315Hz, 0dB)
(Oscillator output at 500Hz, 200mV)	

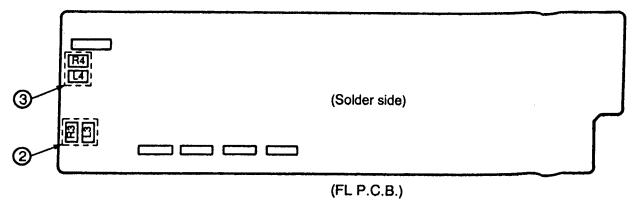
Using the Oscilloscope, check the output waveforms at the test points on the circuit boards of the unit in the following order:
(L1, R1) → (L3, R3) → (L4, R4) → (L5, R5) → (L6, R6).
Refer to page 14.

Note: Connect the ⊕ probe of the oscilloscope to each test point and the ⊖ probe to chassis ground.

TEST POINTS POSITIONS OF AMPLIFIER CIRCUIT

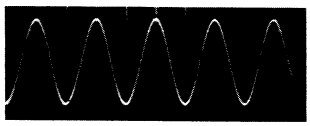
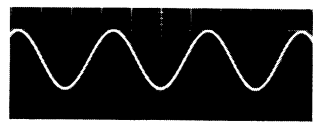
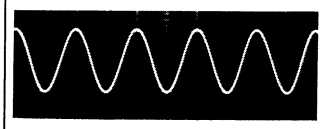
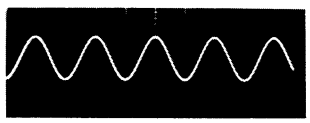
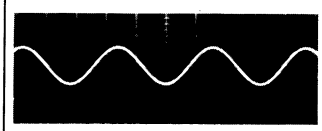
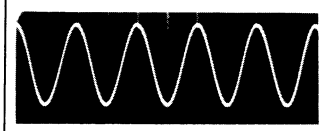
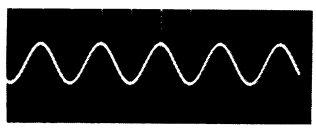
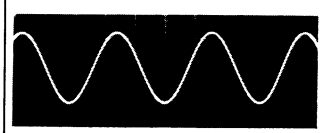
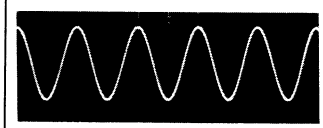
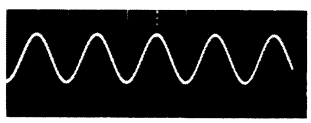
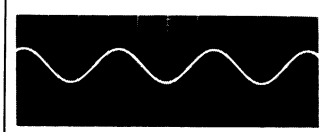
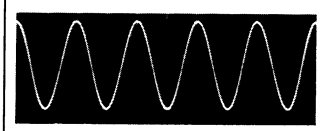
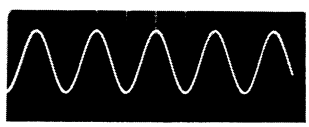
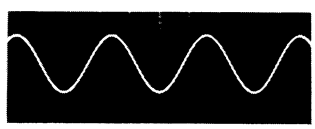
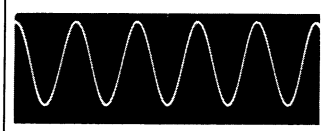


(MAIN P.C.B.)



(FL P.C.B.)

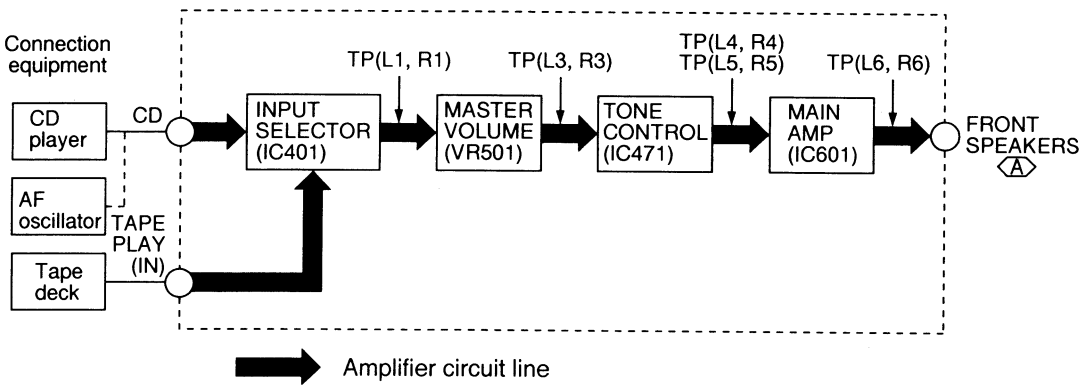
NORMAL WAVEFORMS OF AMPLIFIER CIRCUIT AND LIKELY FAULY BLOCKS

No.	TP	CD player	Tape deck	AF oscillator	Likely faulty block if the normal waveform shown at left is not present.
①	L1/R1	 0.5msec 2V	 1msec 500mV	 1msec 500mV	Input selector block IC402 & area
②	L3/R3	 0.5msec 0.5mV	 1msec 100mV	 1msec 500mV	Master volume block VR501 & area
③	L4/R4	 0.5msec 5V	 1msec 500mV	 1msec 500mV	Tone control block IC471 & area
④	L5/R5	 0.5msec 2V	 1msec 500mV	 1msec 200mV	
⑤	L6/R6	 0.5msec 5V*	 1msec 1V*	 1msec 1V*	Main amplifier block IC601 & area

Measurement conditions. Volume control (VR501), Treble control (VR472) and Bass control (VR471) positions: ◯
∗Volume control position (VR501) for these test : ◯

CIRCUIT BLOCKS

CIRCUIT BLOCKS OF THE MAIN UNIT



■ OVERLOAD DETECTION FUNCTION

The HIC protection circuit functions if any cord at a speaker terminal is short-circuited or if the unit overheats because of improper operation. At the same time, 『OVERLOAD』 scrolls across the FL display.
In this state, all keys remain inoperative; if any key is pressed, 『SWITCH OFF POWER』 scrolls across the FL display.
If an overload occurs, immediately power off the unit and check the speaker connections, venting holes and cooling fans. After fixing any faults, power on the unit again and check for proper operation.
If no defects are found, or if the unit remains overloaded after it is power on again, check the circuit for faults.

■ FAN MOTOR TROUBLESHOOTING GUIDE

The Model SA-GX280 employ fan motor error sensing electronics.
If the cooling fan is not operation and "OVER LOAD" is displayed on the FL display, check the fan motor and its driving circuit.

"OVER LOAD" is displayed on the FL display.

Is the air cooling path blocked or the fan motor jammed by any external obstacle?

YES → Remove the obstacle.

NO

Remove the fan from the unit.

Is the fan motor's DC resistance 20~30Ω?

NO → Fan motor failure
Short circuit: DC resistance below 5Ω
Open circuit: DC resistance over 1kΩ

YES

Reinstall the fan on the unit.

Are the terminal voltage of Q652 and Q653 normal in both active and inactive states of the fan motor? (see table1.)

NO → Check the integrity of Q651, Q652, Q653 and the fan motor driving circuit. (see fig. 1.)

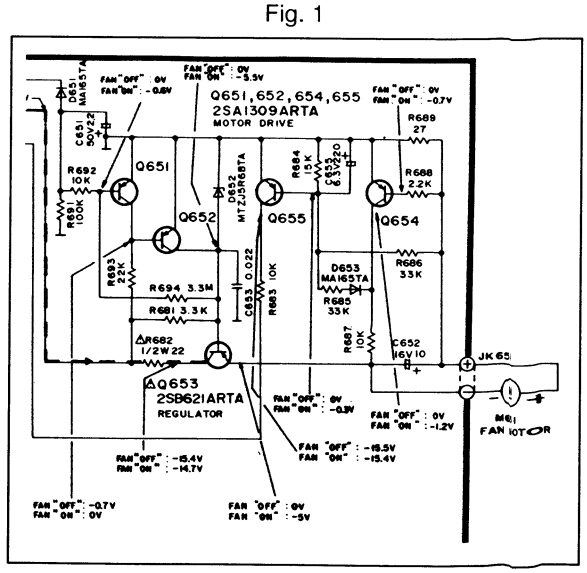
YES

(Voltage table)

		fan. off	fan. on
Q651	E	0V	0V
	C	−0.7V	0V
	B	0V	−0.6V
Q652	E	0V	0V
	C	0V	−5.5V
	B	−0.7V	0V
Q653	E	0V	−5V
	C	−15.4V	−14.7V
	B	0V	−5.5V

(Table 1)

Fig. 1



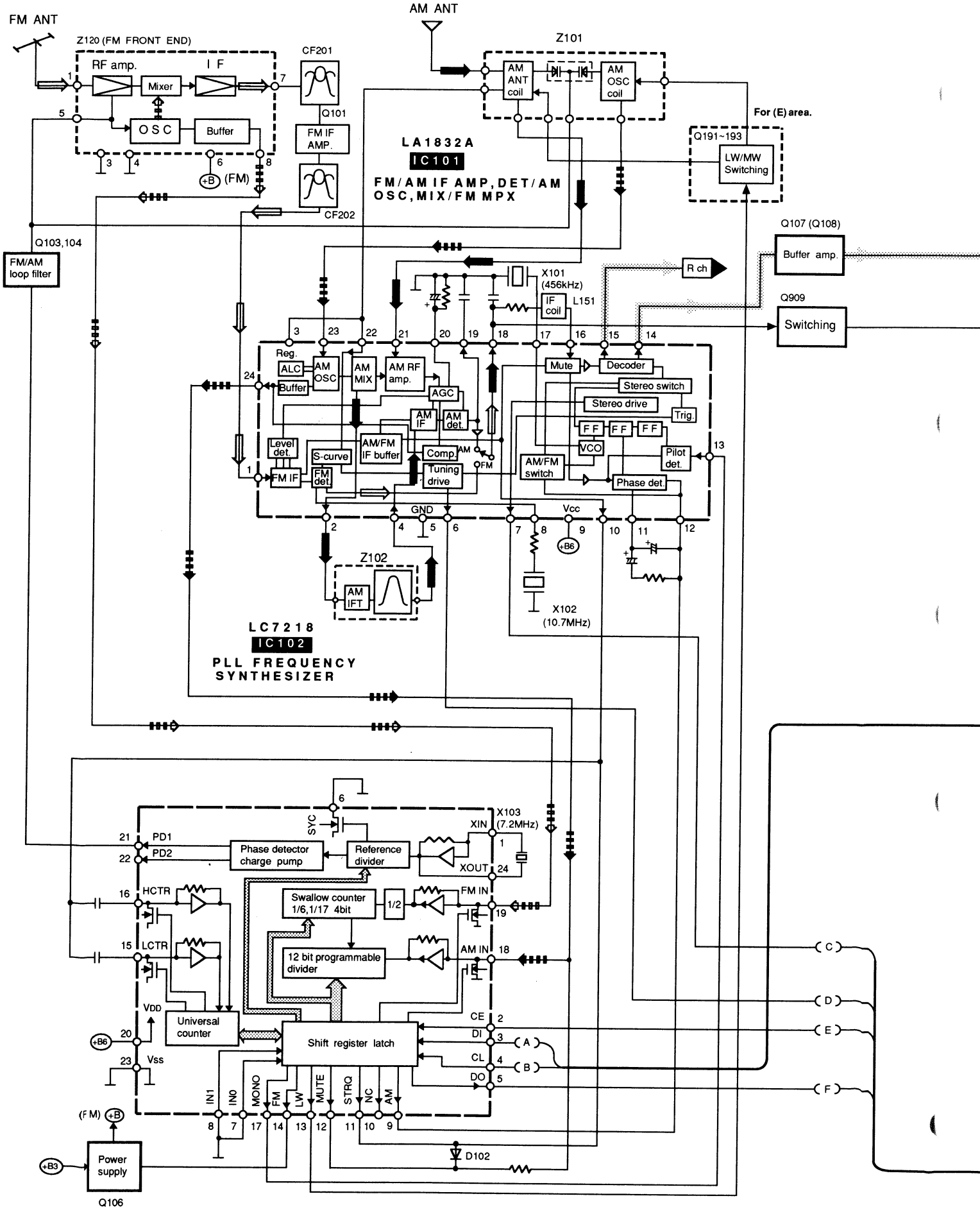
Is an audio signal present at pins ⑦ and ⑩ of IC601

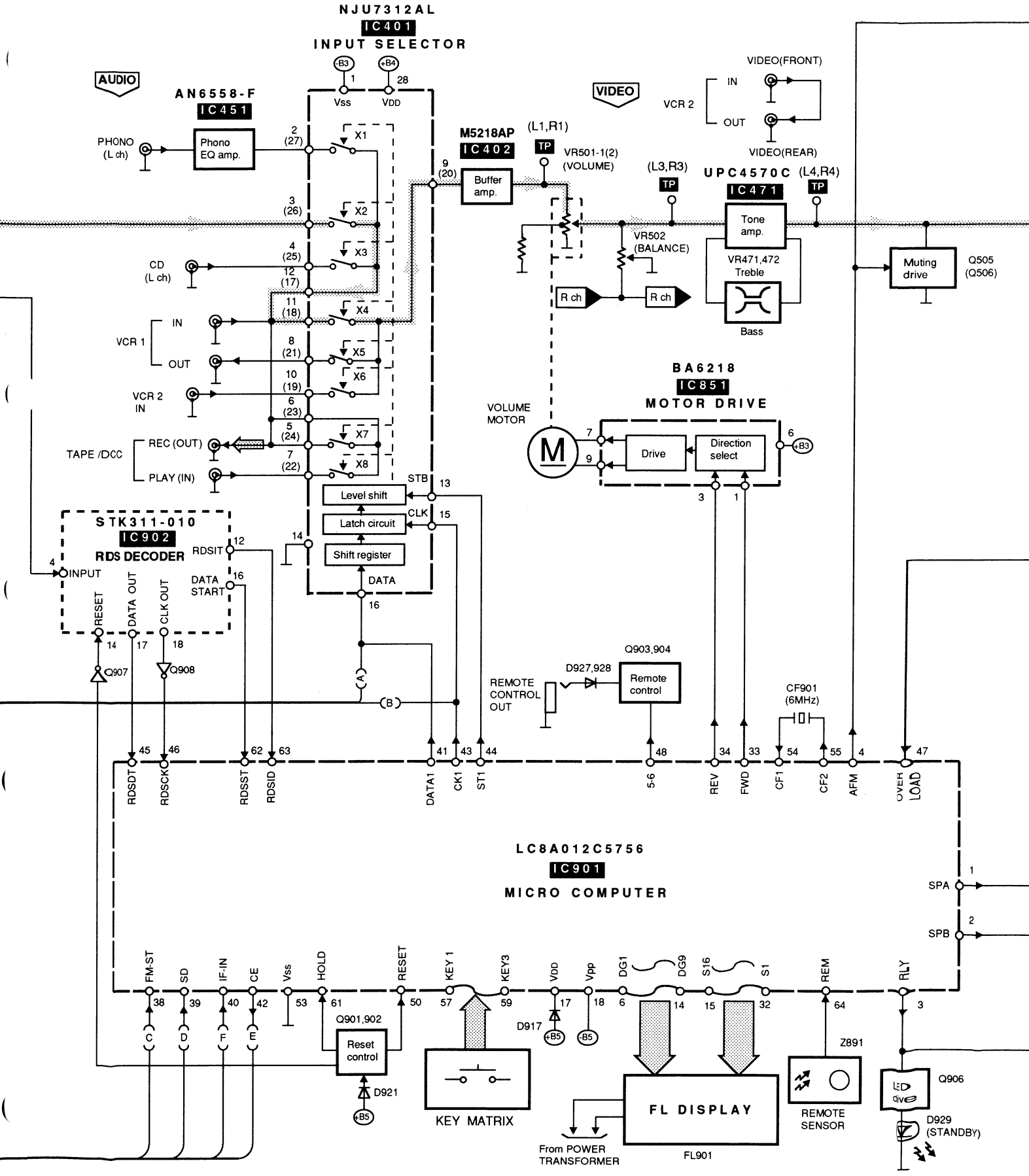
NO → The power IC (IC601) is defective.

YES

The fan motor, power IC and fan driver are functioning normally.

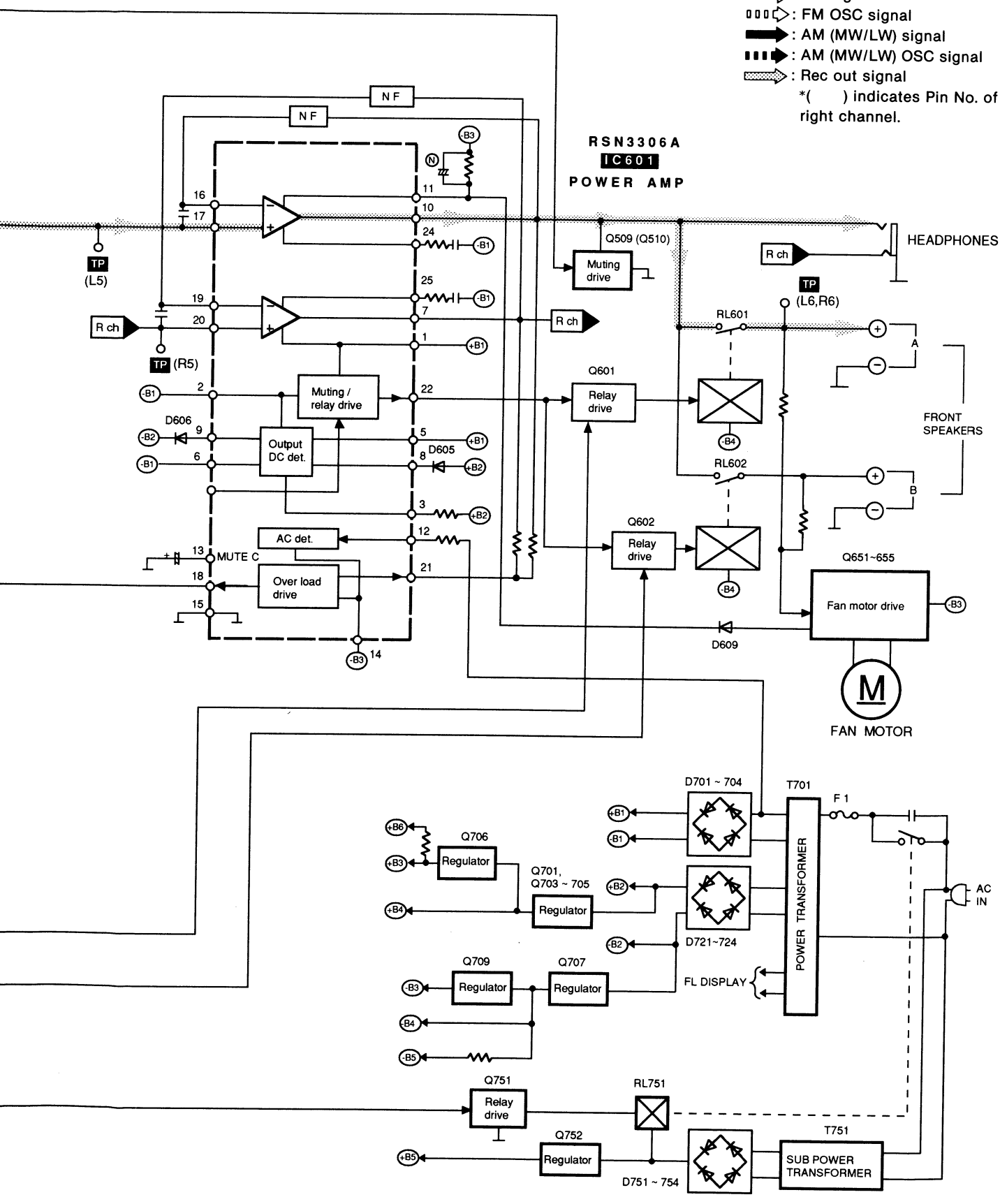
■ BLOCK DIAGRAM




NJU7312AL
IC401
INPUT SELECTOR
AUDIO
AN6558-F
IC451
PHONO (L ch)
Phono EQ amp.
CD (L ch)
VCR 1
IN
OUT
VCR 2
IN
TAPE /DCC
REC (OUT)
PLAY (IN)
X1
X2
X3
X4
X5
X6
X7
X8
Vss
VDD
M5218AP
IC402
Buffer amp.
(L1,R1)
TP
VR501-1(2) (VOLUME)
VIDEO
VIDEO(FRONT)
VCR 2
IN
OUT
VIDEO(REAR)
(L3,R3)
UPC4570C
IC471
(L4,R4)
Tone amp.
VR502 (BALANCE)
VR471,472 Treble
Bass
R ch
Muting drive
Q505 (Q506)
BA6218
IC851
MOTOR DRIVE
VOLUME MOTOR
Drive
Direction select
STK311-010
IC902
RDS DECODER
INPUT
RESET
DATA OUT
CLK OUT
DATA START
RDSIT
Level shift
Latch circuit
Shift register
STB
CLK
DATA
Q907
Q908
REMOTE CONTROL OUT
D927,928
Q903,904
Remote control
CF901 (6MHz)
RDSDT
RDSCK
RDSST
RDSID
DATA1
CK1
ST1
5-6
REV
FWD
CF1
CF2
AFM
OVER LOAD
LC8A012C5756
IC901
MICRO COMPUTER
SPA
SPB
FM-ST
SD
IF-IN
CE
Vss
HOLD
RESET
KEY 1
KEY3
VDD
Vpp
DG1
DG9
S16
S1
REM
RLY
Q901,902
Reset control
D921
D917
KEY MATRIX
FL DISPLAY
FL901
From POWER TRANSFORMER
Z891
REMOTE SENSOR
Q906
LED drive
D929 (STANDBY)

Notes:

: AF signal
: FM signal
: FM OSC signal
: AM (MW/LW) signal
: AM (MW/LW) OSC signal
: Rec out signal
*( ) indicates Pin No. of right channel.



■ SCHEMATIC DIAGRAM (Parts list on pages 38~43.)

(This schematic diagram may be modified at any time with the development of new technology.)

Note:

- **S950, 951, 953~955** : Input select switches. [S950: VCR 1, S951: VCR 2, S953: CD, S954: TUNER, S955: PHONO]
- **S952** : Tape/DCC monitor switch.
- **S956** : Numeric (0) switch.
- **S960** : Numeric (1) switch.
- **S961** : Numeric (2) switch.
- **S962** : Numeric (3) switch.
- **S963** : Numeric (4) switch.
- **S964** : Numeric (5) switch.
- **S965** : Numeric (6) switch.
- **S966** : Numeric (7) switch.
- **S967** : Numeric (8) switch.
- **S968** : Numeric (9) switch.
- **S957** : Muting (MUTING) switch.
- **S970** : Memory (MEMORY) switch.
- **S971** : FM mode select (FM MODE) switch.
- **S972** : Band select (BAND) switch.
- **S973, 974** : Tuning (TUNING) switches. [S973: TUNING DOWN, S974: TUNING UP]
- **S975** : Direct tuning (DIRECT TUNING) switch.
- **S976, 977** : Speaker select (SPEAKERS) switches. [S976: SPEAKERS B, S977: SPEAKERS A]
- **S978** : Power "STANDBY /ON". (POWER STANDBY ON) switch.
- Signal line
  - : FM OSC
  - : AM (MW/LW) OSC
  - : FM signal
  - : AM (MW/LW) signal
  - : Rec out signal (Lch)
  - : AF signal (Lch)
  - : Positive voltage lines
  - : Negative voltage lines

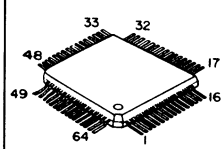
- Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts. Indicated voltage values are standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on internal impedance of the DC circuit tester.
- All voltage values shown in circuitry are DC voltage in FM signal (Stereo signal) reception mode.
- ＊Figures in ( ) Stand for DC-voltage in AM (MW) signal reception mode.
- ＊Figures in 〈 〉 Stand for DC-voltage in LW signal reception mode.
- L1, L3~L6, R1 and R3~R6 in the schematic diagram show the test points. For detail, please refer to p. 13 and p. 14.

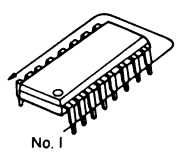
- **Caution!**

  IC and LSI are sensitive to static electricity. Secondary trouble can be prevented by taking care during repair.
- Cover the parts boxes made of plastics with alminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.

• Terminal guide of IC's, transistors and diodes

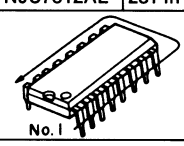
LC8A012C5756



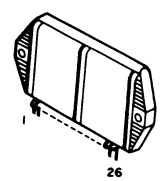


M5218AP	8Pin
LA1832A	24Pin
LC7218	24Pin

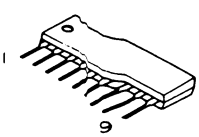
AN6558-F	8Pin
UPC4570C	8Pin
NJU7312AL	28Pin



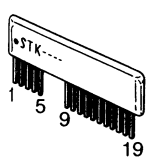
RSN3306A



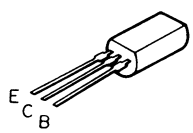
BA6218



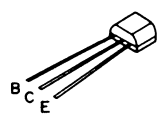
STK311-010



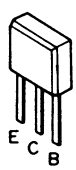
2SC3940AQSTA



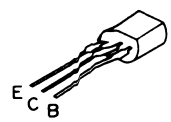
2SC3327ABTP



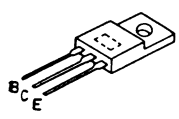
2SA1309ARTA
2SC2785FETA
2SC2787LTA
2SC3311ARTA
UN411FTA
RVTDTC114YST
UN421FTA
RVTDTA144EST
RVTDTC114EST



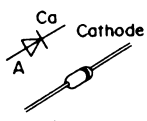
2SB621A RTA



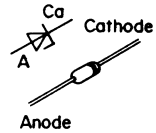
2SD2374PQAU
2SB1548PQAU



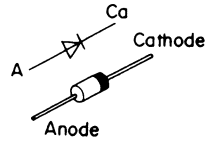
MA165TA
MA700ATA
1SS291TA
1SR35200TB



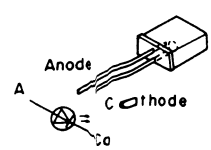
MTZJ5R1BTA
MTZJ7R5CTA
MTZJ5R6BTA
MTZJ6R2BTA
MTZJ22DTA
MTZJ16CTA
MTZJ6R8CTA
MTZJ3R9ATA



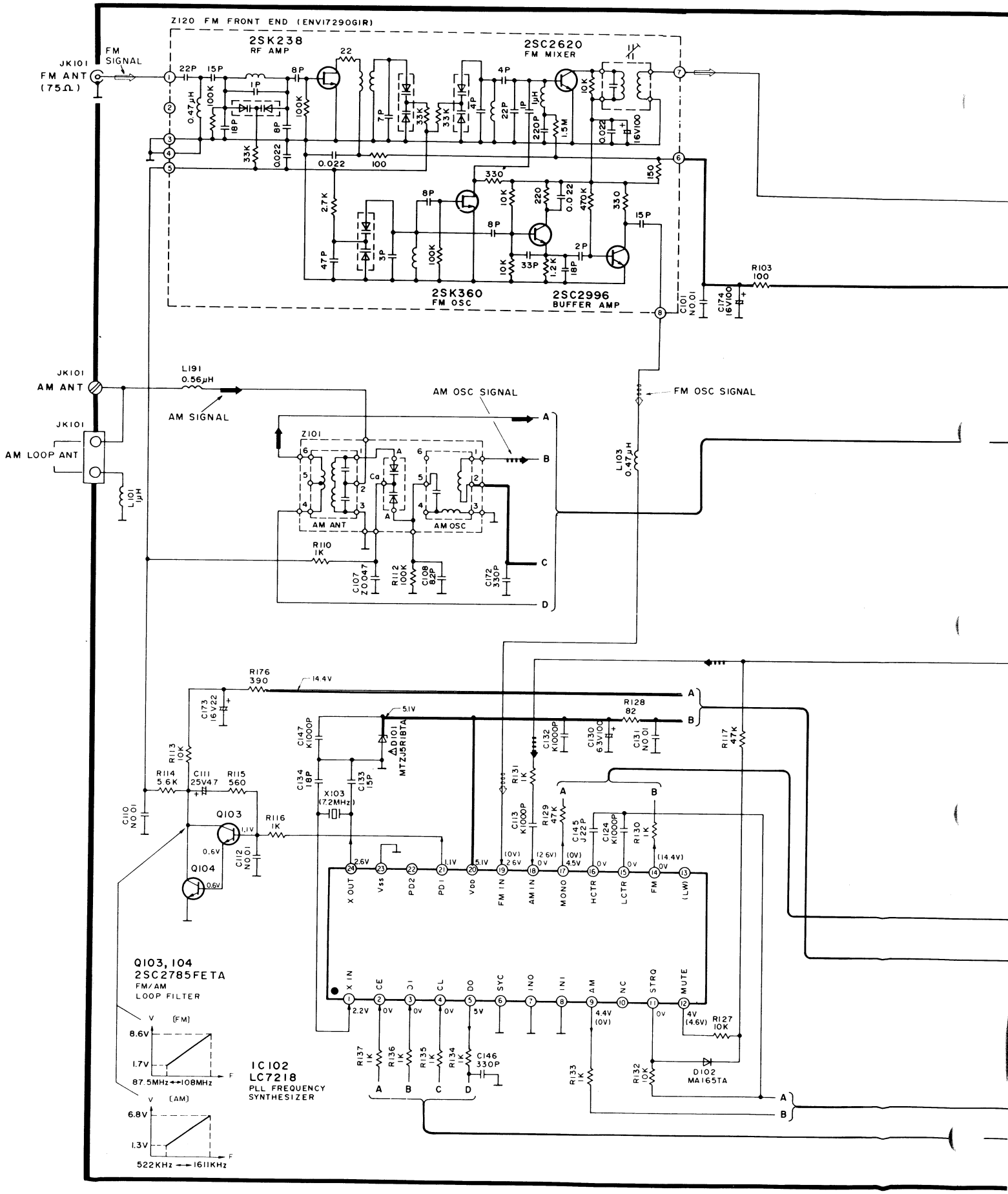
P300DLF
SB360L6508

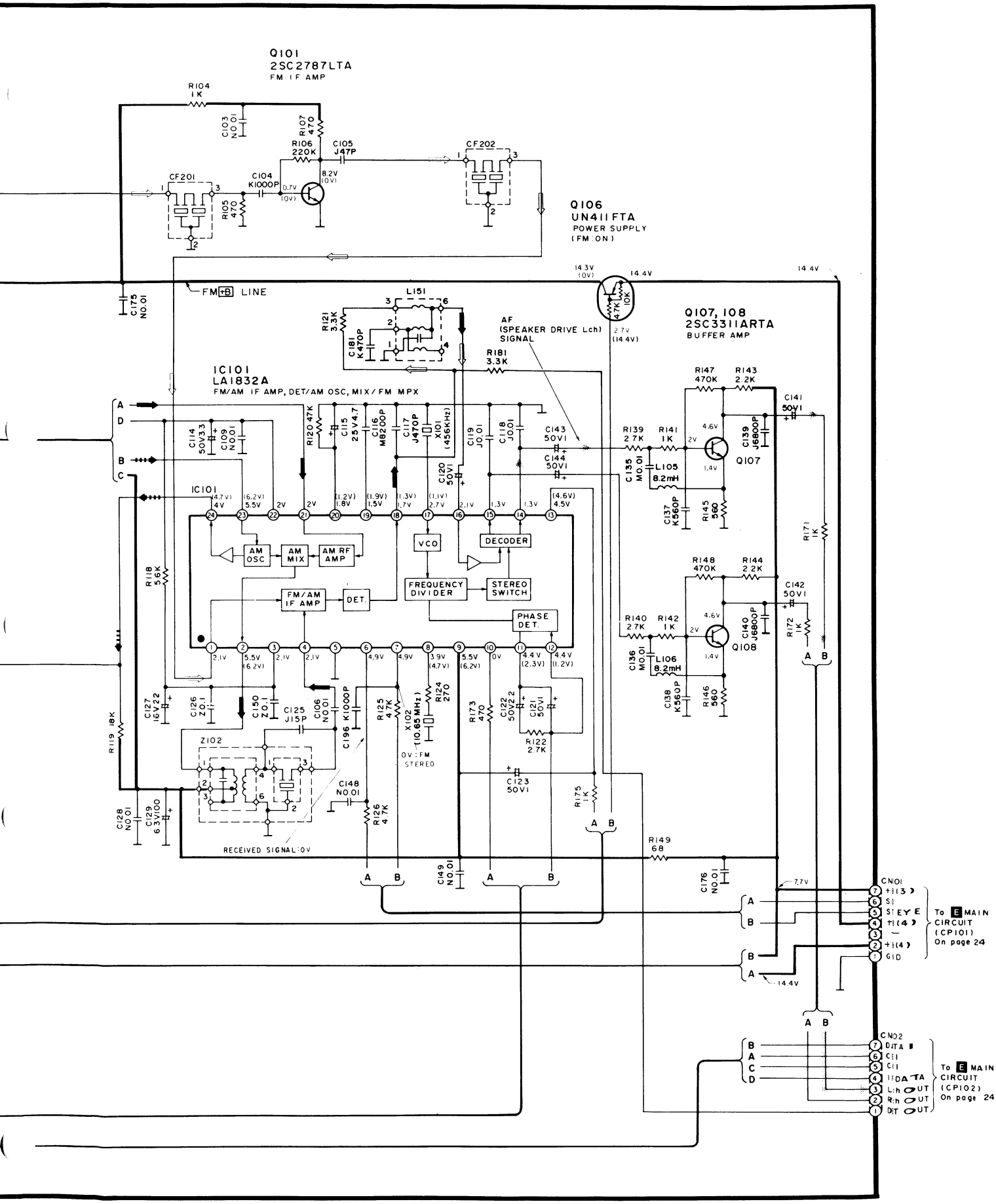


LN86RPH

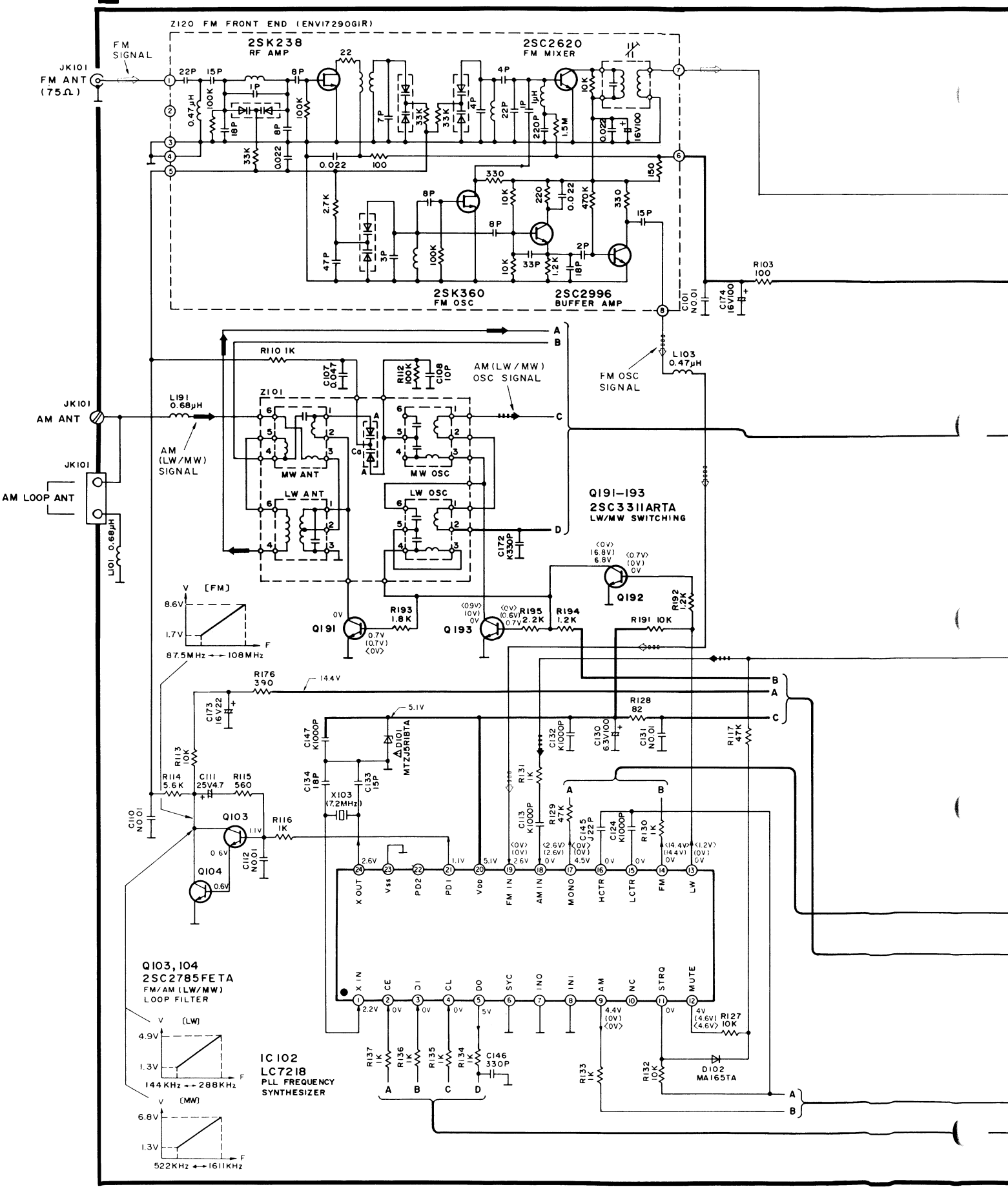


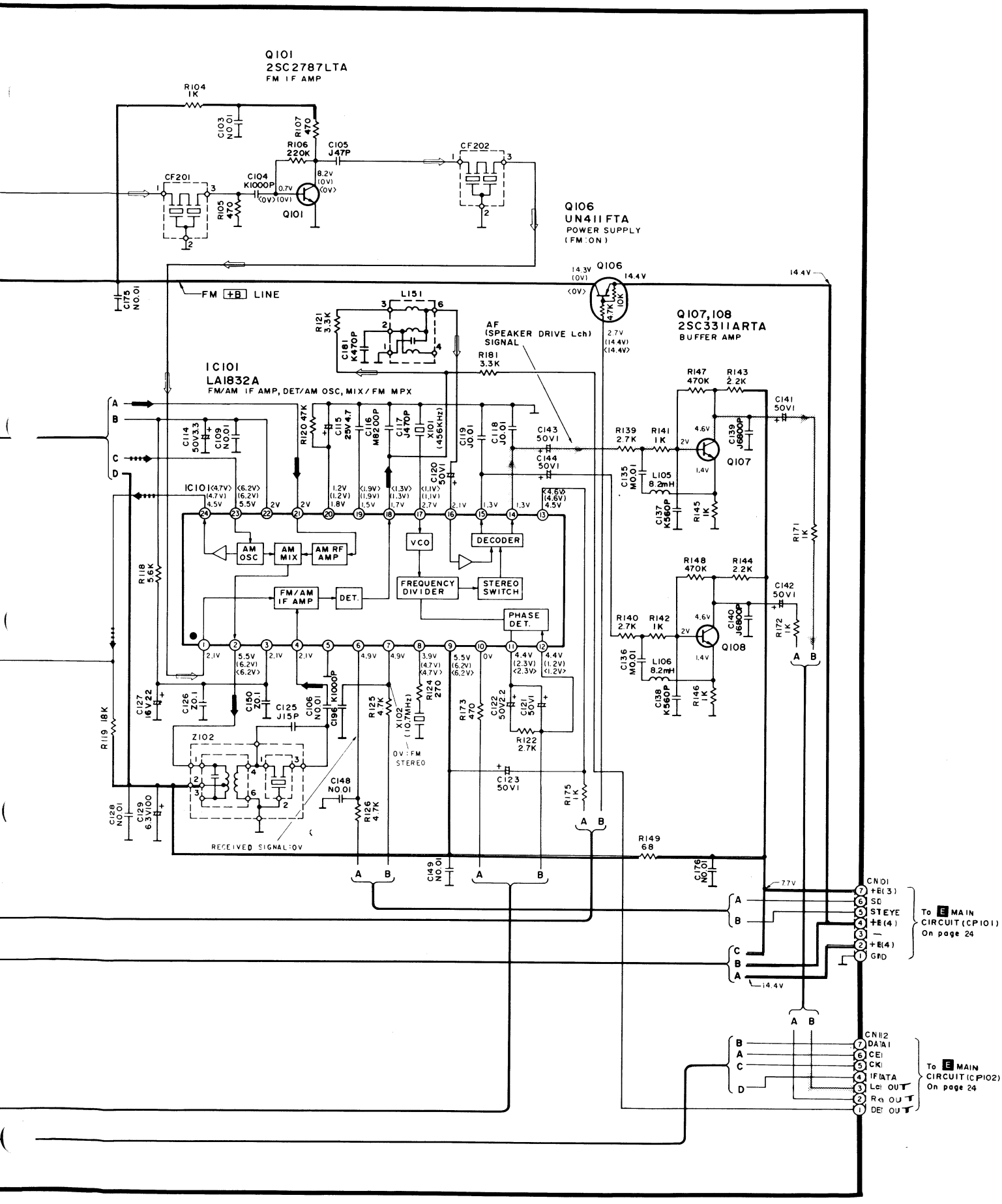
A TUNER CIRCUIT For [EG] area. (P.C.Board:on page 30)

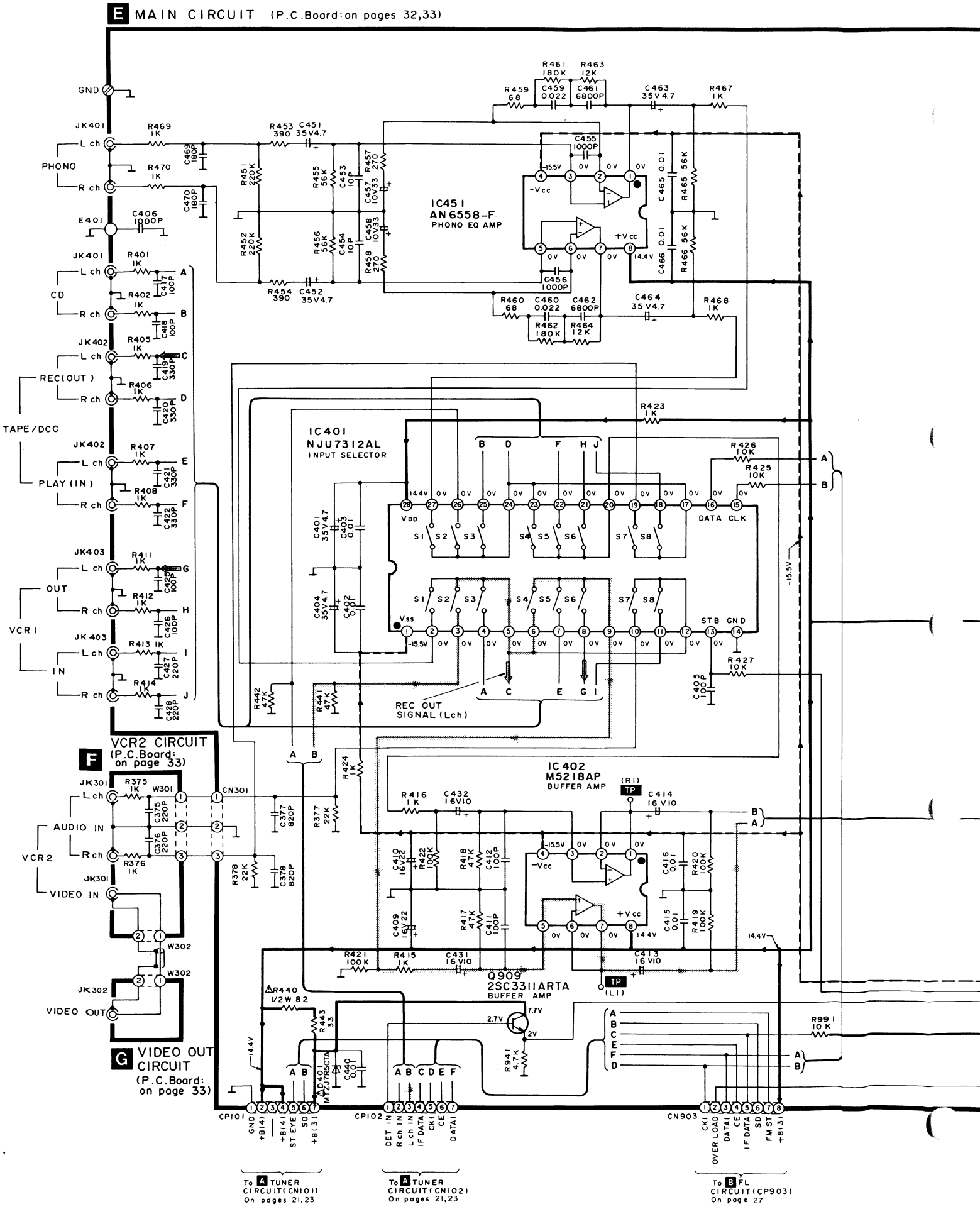


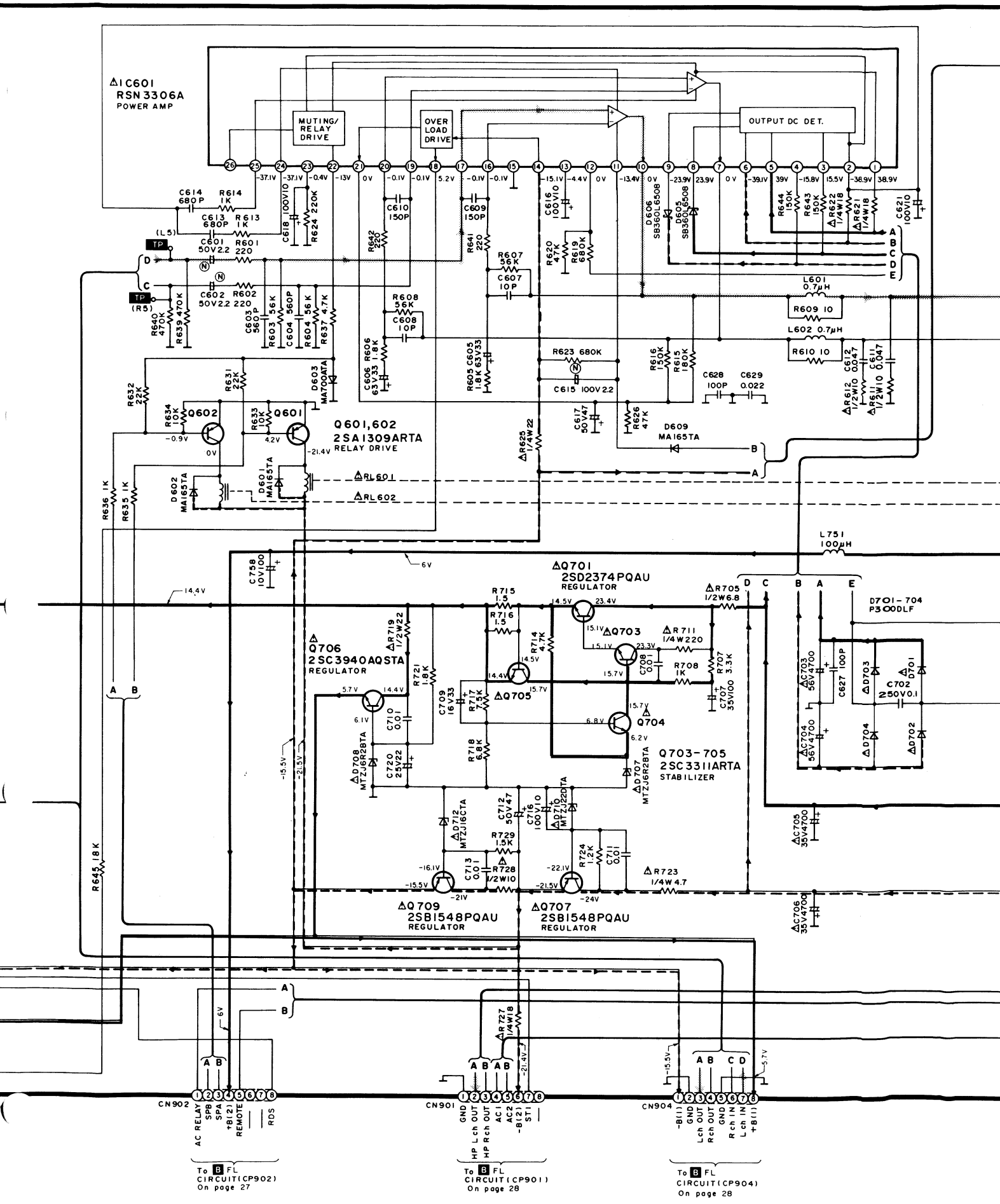

Q101
2SC2787LTA
FM I F AMP
Q106
UN411FTA
POWER SUPPLY
(FM:ON)
Q107, 108
2SC3311ARTA
BUFFER AMP
IC101
LA1832A
FM/AM IF AMP, DET/AM OSC, MIX/FM MPX
FM+B LINE
AF
(SPEAKER DRIVE Lch)
SIGNAL
VCO
DECODER
AM OSC
AM MIX
AM RF AMP
FM/AM IF AMP
DET.
FREQUENCY DIVIDER
STEREO SWITCH
PHASE DET.
RECEIVED SIGNAL:0V
0V:FM STEREO
To E MAIN CIRCUIT (CP101) On page 24
To E MAIN CIRCUIT (CP102) On page 24

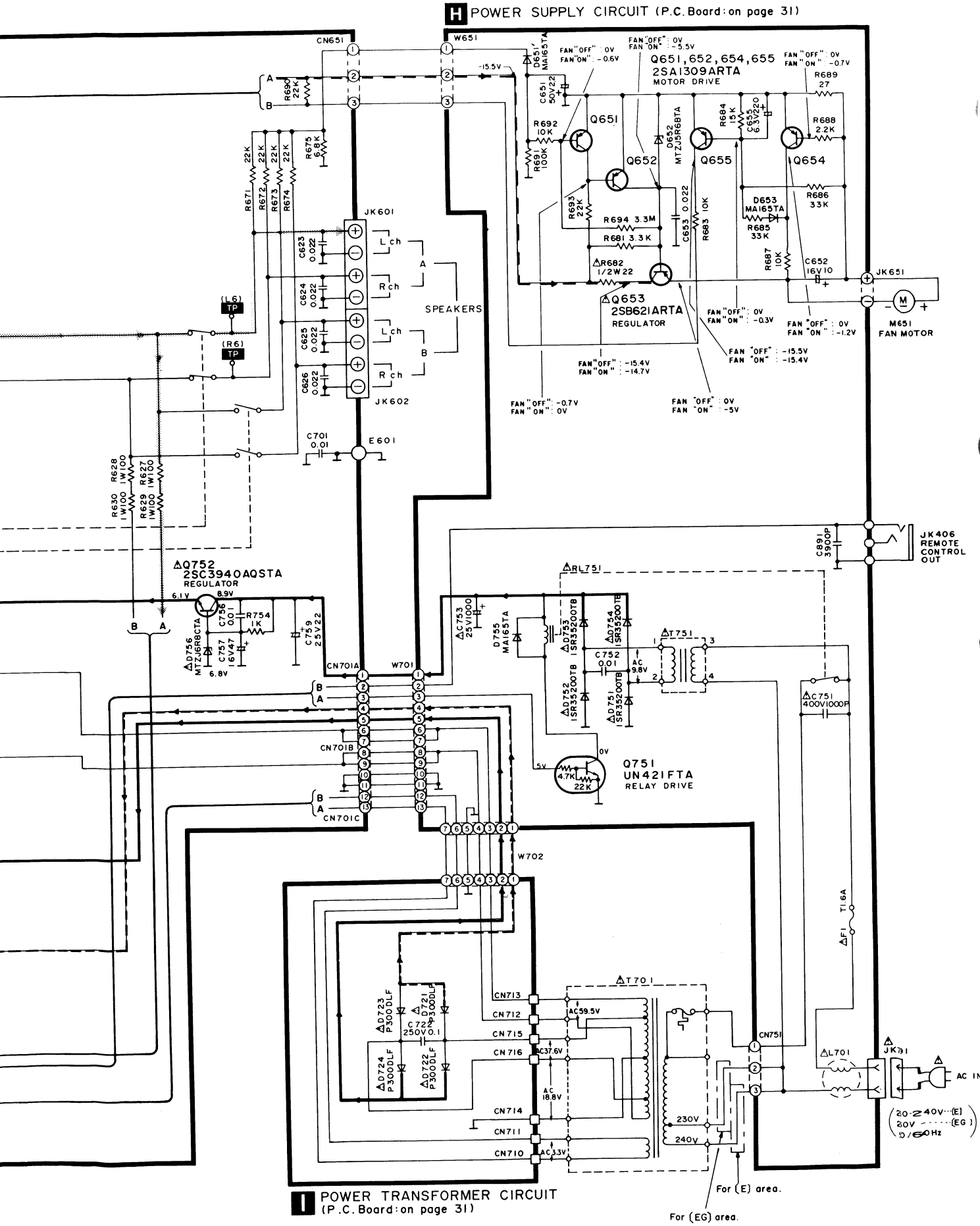
A TUNER CIRCUIT For [E] area. (P.C.Board:on page 30)

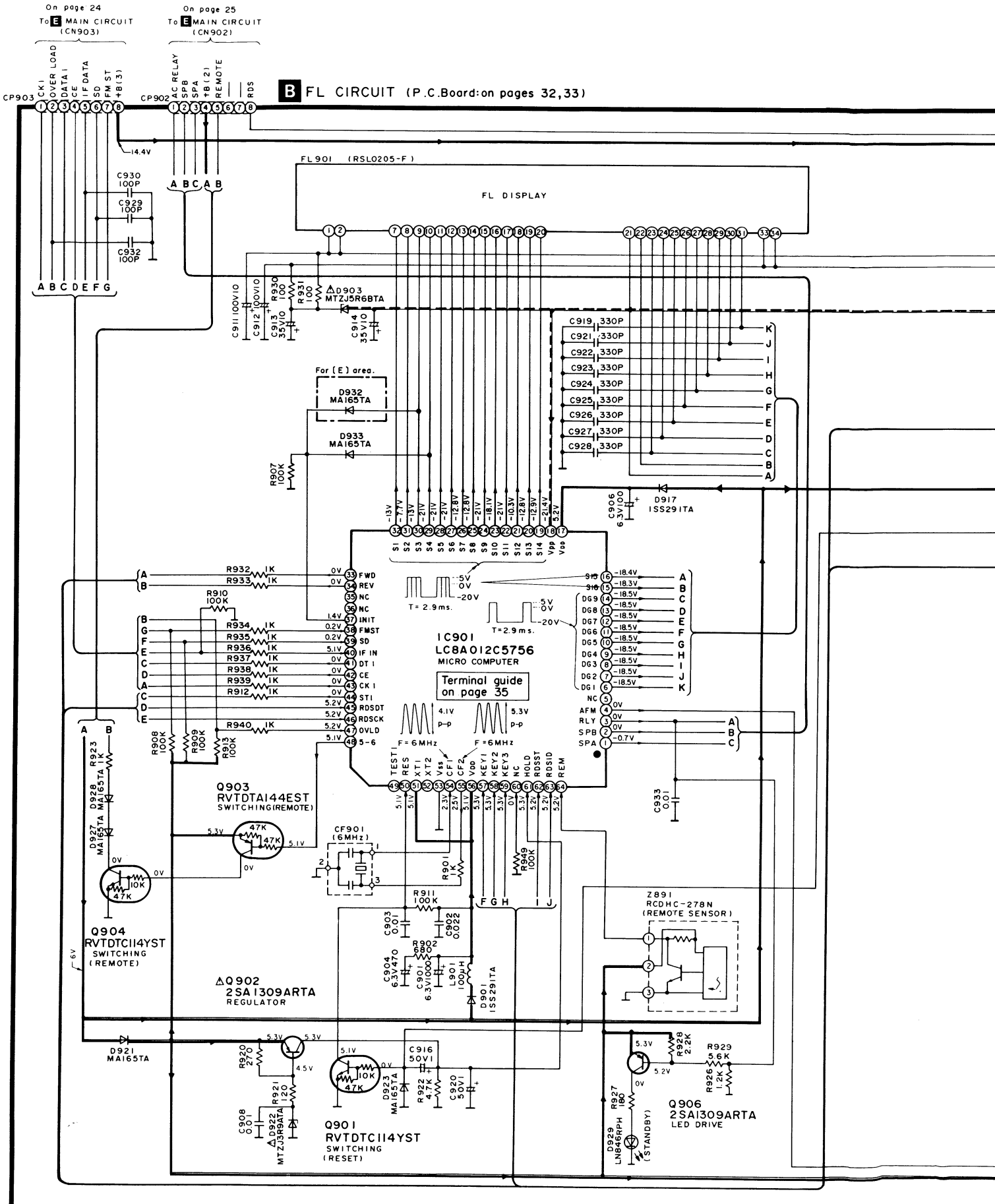


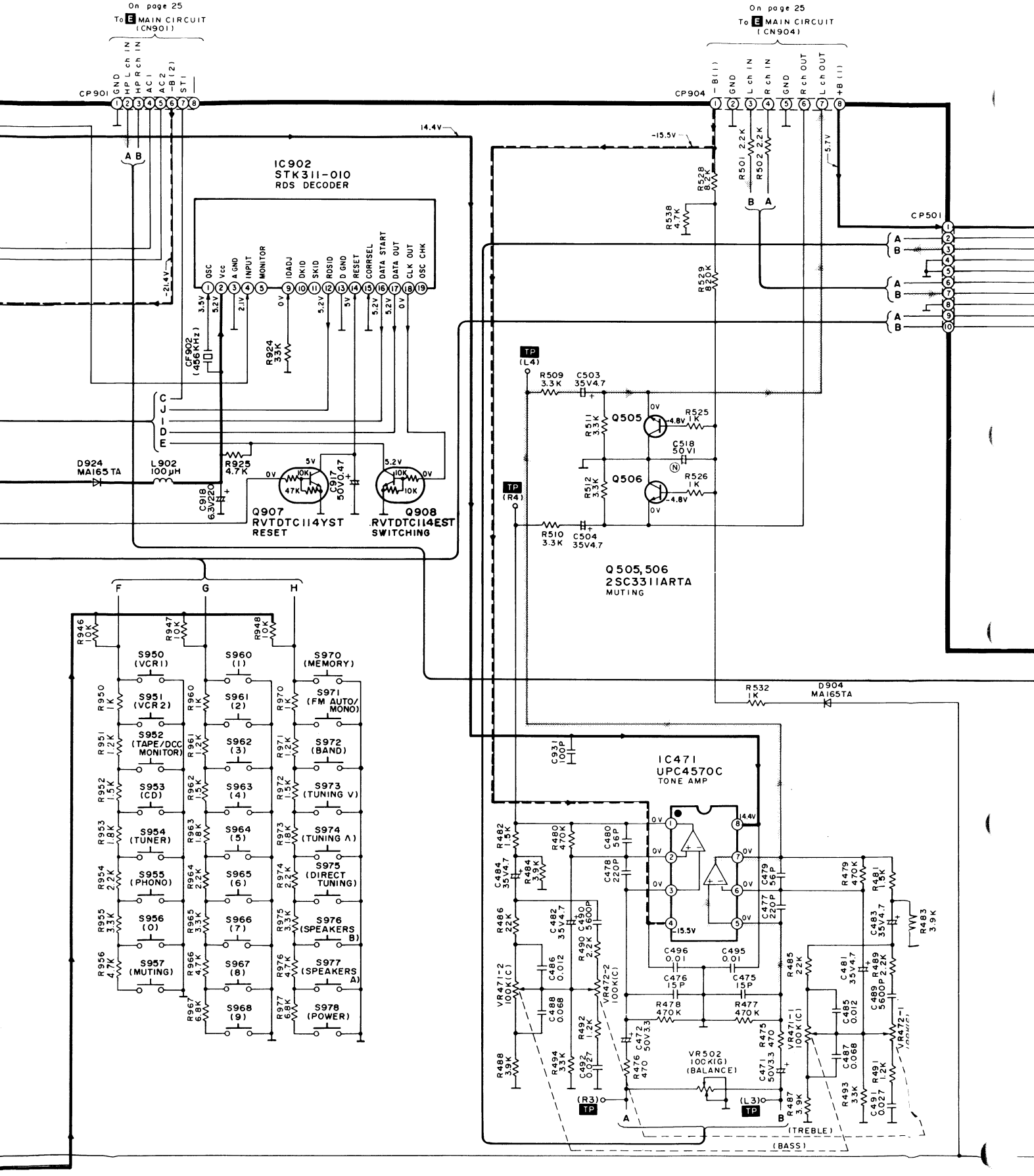

Q101
2SC2787LTA
FM IF AMP
R104 1K
C103 NO.01
R107 470
R106 220K
C105 J47P
CF202
CF201
C104 K1000P
R105 470
Q101
Q106
UN411FTA
POWER SUPPLY
(FM:ON)
FM +B LINE
C175 NO.01
L151
R121 3.3K
C181 K470P
AF (SPEAKER DRIVE Lch) SIGNAL
R181 3.3K
IC101
LA1832A
FM/AM IF AMP, DET/AM OSC, MIX/FM MPX
Q107,108
2SC3311ARTA
BUFFER AMP
R147 470K
R143 2.2K
C141 50V1
R139 2.7K
R141 1K
C139 J6800P
Q107
C135 M0.01
L105 8.2mH
C137 K560P
R145 1K
R171 1K
R148 470K
R144 2.2K
C142 50V1
R140 2.7K
R142 1K
C140 J6800P
Q108
C136 M0.01
L106 8.2mH
C138 K560P
R146 1K
R172 1K
R118 5.6K
R119 18K
C114 50V33
C109 NO.01
R120 47K
C115 25V4.7
C116 M8200P
C117 J470P
X101 (456KHz)
C119 J0.01
C118 J0.01
C143 50V1
C144 50V1
C120 50V1
AM OSC
AM MIX
AM RF AMP
VCO
DECODER
FM/AM IF AMP
DET.
FREQUENCY DIVIDER
STEREO SWITCH
PHASE DET.
C127 16V22
C126 Z0.1
C150 Z0.1
C125 J15P
C106 NO.01
C196 K1000P
R125 4.7K
X102 (10.7MHz)
R124 270
R173 470
C122 50V2.2
C121 50V1
R122 2.7K
C123 50V1
Z102
C148 NO.01
R126 4.7K
C128 NO.01
C129 6.3V100
RECEIVED SIGNAL:0V
0V:FM STEREO
R175 1K
R149 68
C149 NO.01
C176 NO.01
CN101
+B(3)
SD
STEYE
+B(4)
—
+B(4)
GND
To E MAIN CIRCUIT (CP101) On page 24
CN112
DATA I
CE I
CK I
IF DATA
Lch OUT
Rch OUT
DET OUT
To E MAIN CIRCUIT (CP102) On page 24


E MAIN CIRCUIT (P.C.Board:on pages 32,33)
GND
PHONO
JK401
L ch
R ch
E401
CD
JK402
REC(OUT)
TAPE/DCC
PLAY (IN)
JK403
OUT
VCR 1
IN
IC451
AN6558-F
PHONO EQ AMP
IC401
NJU7312AL
INPUT SELECTOR
VDD
Vss
DATA CLK
STB GND
REC OUT
SIGNAL (Lch)
IC402
M5218AP
BUFFER AMP
Q909
2SC3311ARTA
BUFFER AMP
F VCR2 CIRCUIT
(P.C.Board:
on page 33)
JK301
AUDIO IN
VCR2
VIDEO IN
JK302
VIDEO OUT
W301
W302
CN301
G VIDEO OUT
CIRCUIT
(P.C.Board:
on page 33)
CP101
GND
+B(4)
ST EYE
SD
+B(3)
CP102
DET IN
R ch IN
L ch IN
IF DATA
CK
CE
DATA
CN903
CK
OVER LOAD
DATA
CE
IF DATA
SD
FM ST
+B(3)
To A TUNER CIRCUIT(CN101) On pages 21,23
To A TUNER CIRCUIT(CN102) On pages 21,23
To B FL CIRCUIT(CP903) On page 27

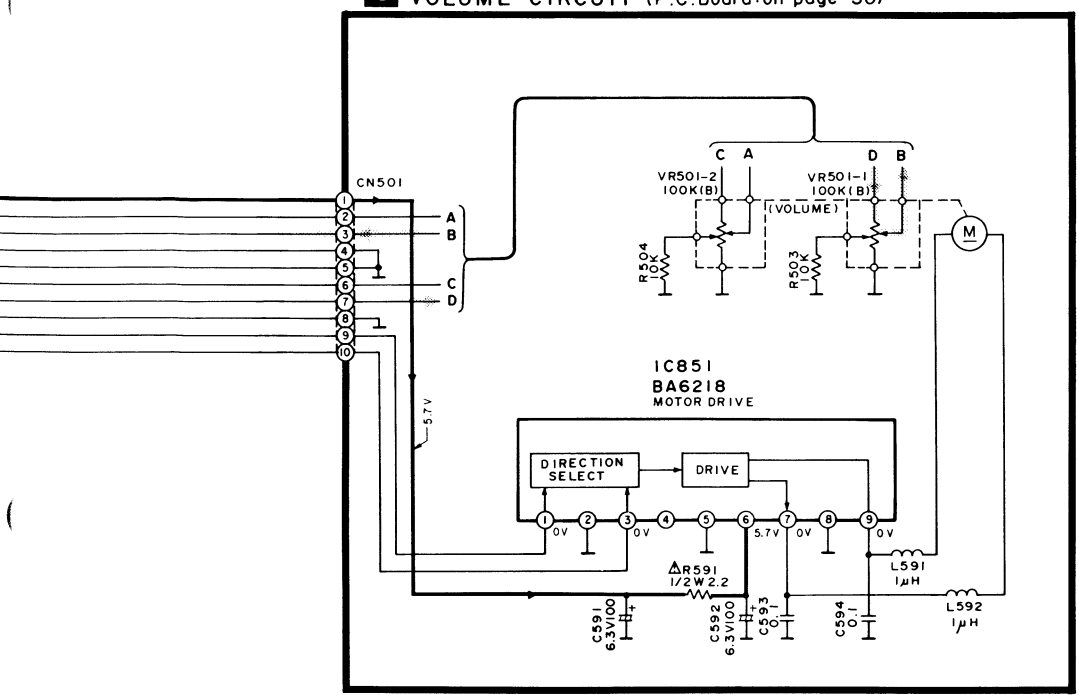

△IC601
RSN3306A
POWER AMP
MUTING/ RELAY DRIVE
OVER LOAD DRIVE
OUTPUT DC DET.
Q601,602
2SA1309ARTA
RELAY DRIVE
△Q701
2SD2374PQAU
REGULATOR
△Q706
2SC3940AQSTA
REGULATOR
Q703-705
2SC3311ARTA
STABILIZER
△Q709
2SB1548PQAU
REGULATOR
△Q707
2SB1548PQAU
REGULATOR
D701-704
P300DLF
CN902
CN901
CN904
To B FL CIRCUIT(CP902) On page 27
To B FL CIRCUIT(CP901) On page 28
To B FL CIRCUIT(CP904) On page 28

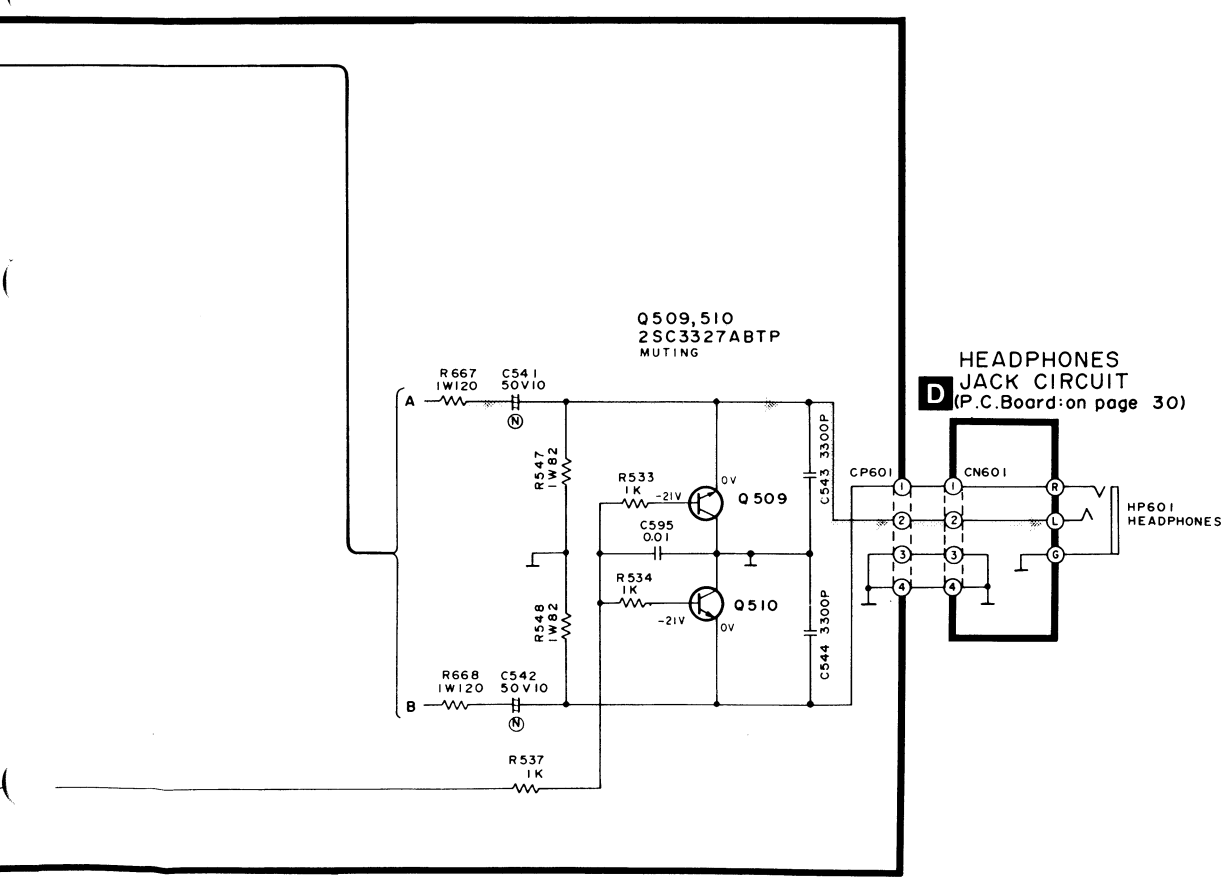

H POWER SUPPLY CIRCUIT (P.C.Board:on page 31)
CN651
W651
-15.5V
D651 MA165TA
C651 50V22
FAN "OFF" : 0V
FAN "ON" : -0.6V
FAN "OFF" : 0V
FAN "ON" : -5.5V
Q651,652,654,655
2SA1309ARTA
MOTOR DRIVE
FAN "OFF" : 0V
FAN "ON" : -0.7V
R689 27
R692 10K
R691 100K
Q651
Q652
D652 MTZJ5R6BTA
R684 15K
C655 6.3V220
Q655
R688 2.2K
Q654
R693 22K
R694 3.3M
R681 3.3K
C653 0.022
R683 10K
D653 MA165TA
R685 33K
R686 33K
R687 10K
C652 16V10
JK651
△R682 1/2W22
△Q653
2SB621ARTA
REGULATOR
FAN "OFF" : 0V
FAN "ON" : -0.3V
FAN "OFF" : 0V
FAN "ON" : -1.2V
M651
FAN MOTOR
FAN "OFF" : -15.4V
FAN "ON" : -14.7V
FAN "OFF" : -15.5V
FAN "ON" : -15.4V
FAN "OFF" : -0.7V
FAN "ON" : 0V
FAN "OFF" : 0V
FAN "ON" : -5V
R671 22K
R672 22K
R673 22K
R674 22K
R675 6.8K
R690 22K
A
B
JK601
C623 0.022
C624 0.022
C625 0.022
C626 0.022
L ch
R ch
L ch
R ch
A
B
SPEAKERS
JK602
(L6)
TP
(R6)
TP
C701 0.01
E601
R628 1W100
R627 1W100
R630 1W100
R629 1W100
C891 3900P
JK406
REMOTE CONTROL OUT
△Q752
2SC3940AQSTA
REGULATOR
6.1V
8.9V
C756 0.01
R754 1K
C759 25V22
△D756 MTZJ6R8CTA
C757 16V47
6.8V
B
A
CN701A
W701
△RL751
△C753 25V1000
D755 MA165TA
△D754 1SR35200TB
△D753 1SR35200TB
△T751
C752 0.01
AC 9.8V
△D752 1SR35200TB
△D751 1SR35200TB
△C751 400V1000P
CN701B
5V
0V
4.7K
22K
Q751
UN421FTA
RELAY DRIVE
B
A
CN701C
W702
△FI T1.6A
△T701
CN713
CN712
CN715
CN716
CN714
CN711
CN710
△D723 P300DLF
△D721 P300DLF
C722 250V0.1
△D724 P300DLF
△D722 P300DLF
AC59.5V
AC37.6V
AC 18.8V
AC3.3V
CN751
△L701
△JK701
AC IN
230V
240V
220-240V (E)
230V (EG)
50/60Hz
I POWER TRANSFORMER CIRCUIT
(P.C.Board:on page 31)
For (E) area.
For (EG) area.


On page 24
To E MAIN CIRCUIT (CN903)
On page 25
To E MAIN CIRCUIT (CN902)
B FL CIRCUIT (P.C.Board:on pages 32,33)
CP903
CP902
FL901 (RSL0205-F)
FL DISPLAY
For (E) area.
D932 MA165TA
D933 MA165TA
D903 MTZJ5R6BTA
D917 1SS291TA
IC901 LC8A012C5756 MICRO COMPUTER
Terminal guide on page 35
Q903 RVTDTA144EST SWITCHING(REMOTE)
Q904 RVTDTC114YST SWITCHING (REMOTE)
Q902 2SA1309ARTA REGULATOR
Q901 RVTDTC114YST SWITCHING (RESET)
Q906 2SA1309ARTA LED DRIVE
CF901 (6MHz)
Z891 RCDHC-278N (REMOTE SENSOR)
D921 MA165TA
D927 MA165TA
D928 MA165TA
D929 LN846RPH (STANDBY)
D901 1SS291TA
D922 MTZJ5R9ATA
D923 MA165TA
FWD
REV
INIT
FMST
SD
IF IN
DT I
CE
CK I
STI
RDSDT
RDSCK
OVLD
RDSID
REM
HOLD
RDSST
AFM
RLY
SPB
SPA
T= 2.9ms.
F=6MHz
4.1V p-p
5.3V p-p


On page 25
To E MAIN CIRCUIT (CN901)
CP901
GND
HP Lch IN
HP Rch IN
AC1
AC2
-B(2)
ST1
On page 25
To E MAIN CIRCUIT (CN904)
CP904
-B(1)
GND
Lch IN
Rch IN
GND
Rch OUT
Lch OUT
+B(1)
CP501
14.4V
-15.5V
5.7V
IC902
STK311-010
RDS DECODER
OSC
Vcc
A GND
INPUT
MONITOR
IDADJ
DKID
SKID
RDSID
D GND
RESET
CORRSEL
DATA START
DATA OUT
CLK OUT
OSC CHK
CF902 (456KHz)
R924 33K
R528 82K
R538 4.7K
R501 2.2K
R502 2.2K
R529 82K
TP (L4)
R509 3.3K
C503 35V4.7
Q505
R511 3.3K
R525 1K
C518 50V1
Q506
R512 3.3K
R526 1K
TP (R4)
R510 3.3K
C504 35V4.7
Q505, 506
2SC3311ARTA
MUTING
D924 MA165TA
L902 100μH
R925 4.7K
C918 6.3V220
C917 50V0.47
Q907
RVTDTC114YST
RESET
Q908
RVTDTC114EST
SWITCHING
R532 1K
D904 MA165TA
C931 100P
IC471
UPC4570C
TONE AMP
R946 10K
R947 10K
R948 10K
S950 (VCR1)
S951 (VCR2)
S952 (TAPE/DCC MONITOR)
S953 (CD)
S954 (TUNER)
S955 (PHONO)
S956 (0)
S957 (MUTING)
S960 (1)
S961 (2)
S962 (3)
S963 (4)
S964 (5)
S965 (6)
S966 (7)
S967 (8)
S968 (9)
S970 (MEMORY)
S971 (FM AUTO/MONO)
S972 (BAND)
S973 (TUNING V)
S974 (TUNING Λ)
S975 (DIRECT TUNING)
S976 (SPEAKERS B)
S977 (SPEAKERS A)
S978 (POWER)
VR502 100K(G) (BALANCE)
(TREBLE)
(BASS)
TP (R3)
TP (L3)

C VOLUME CIRCUIT (P.C.Board:on page 30)



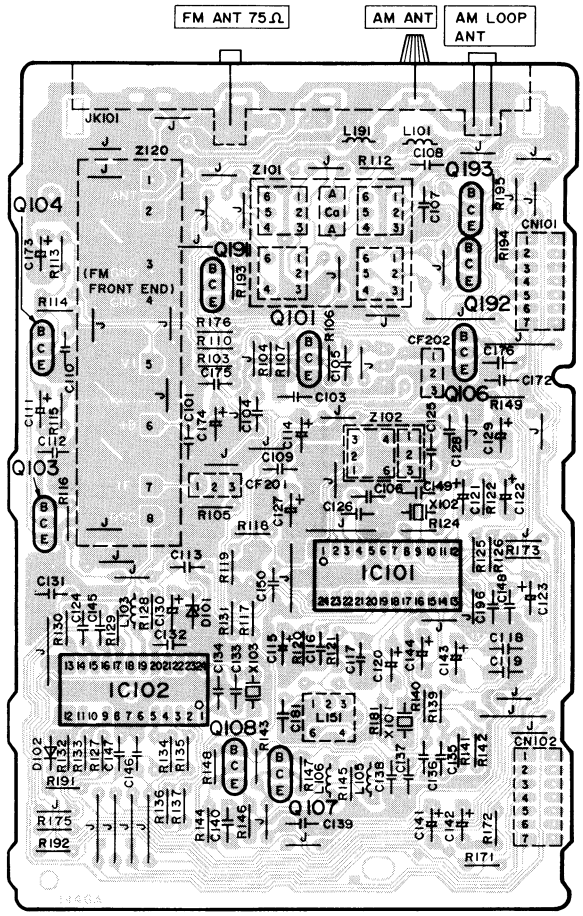


D HEADPHONES JACK CIRCUIT (P.C.Board:on page 30)

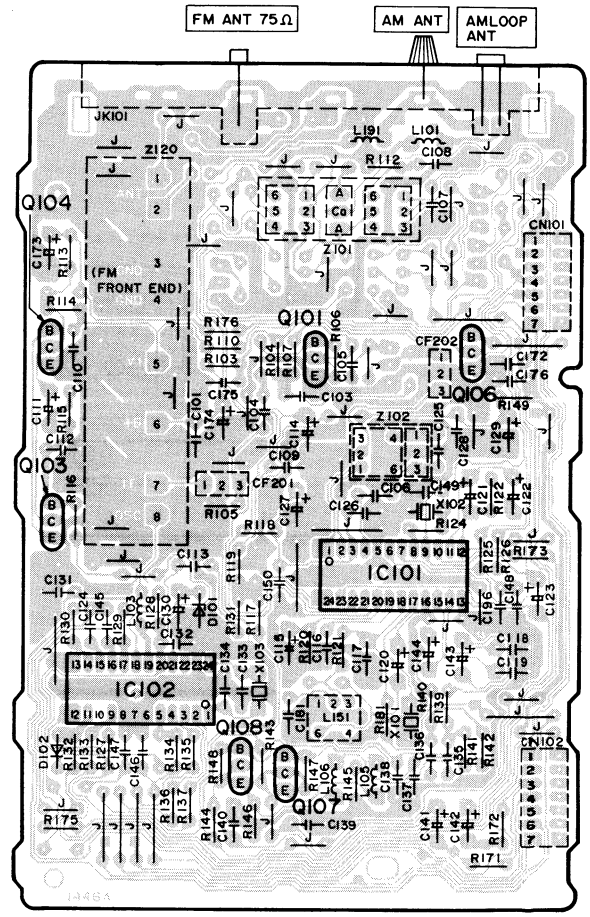
■ PRINTED CIRCUIT BOARDS

- This circuit board diagram may be modified at any time with the development of new technology.
- L1, L3~L6, R1 and R3~R6 in the circuit board diagram show the test points.
  For detail, please refer to p. 13 and p. 14.

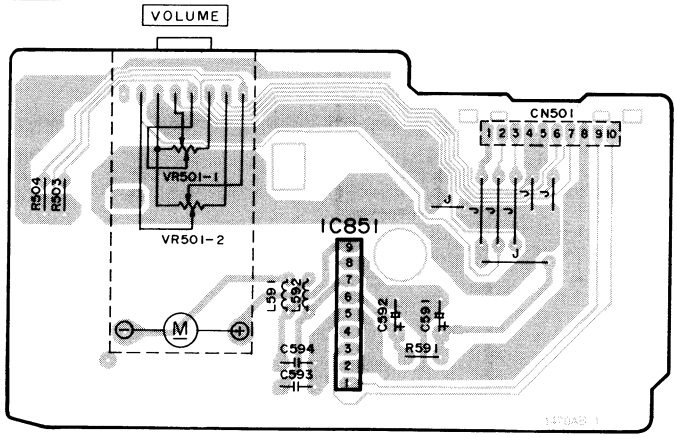
A TUNER P.C.B. For [E] area. (REP2158B–T)



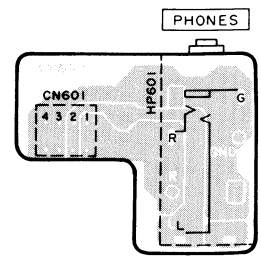
A TUNER P.C.B. For [EG] area. (REP2158A–T)



C VOLUME P.C.B. (REP2160C–S•••[EG] / REP2160D–S•••[E])

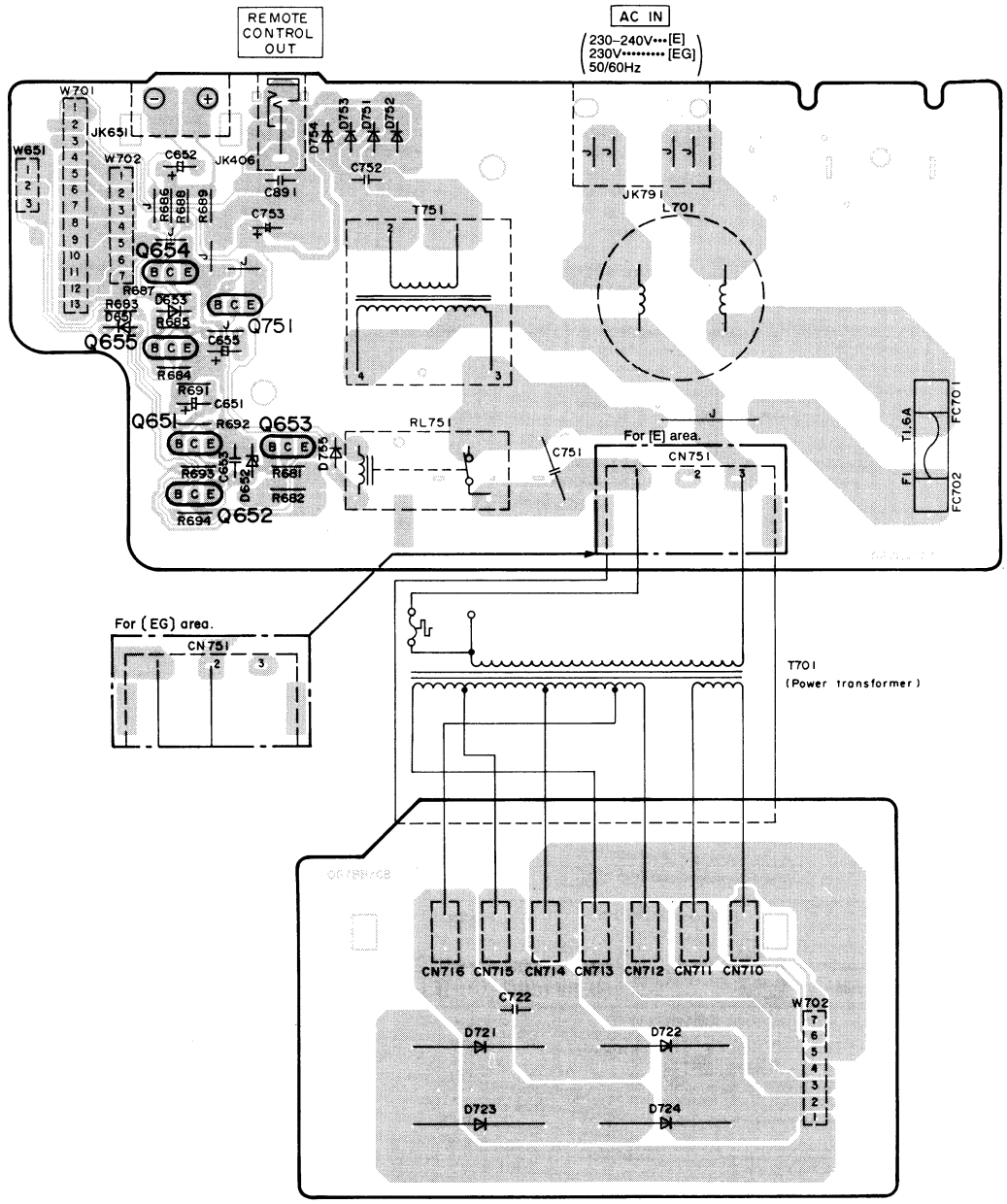


D HEADPHONES JACK P.C.B. (REP2160C–S•••[EG] / REP2160D–S•••[E])

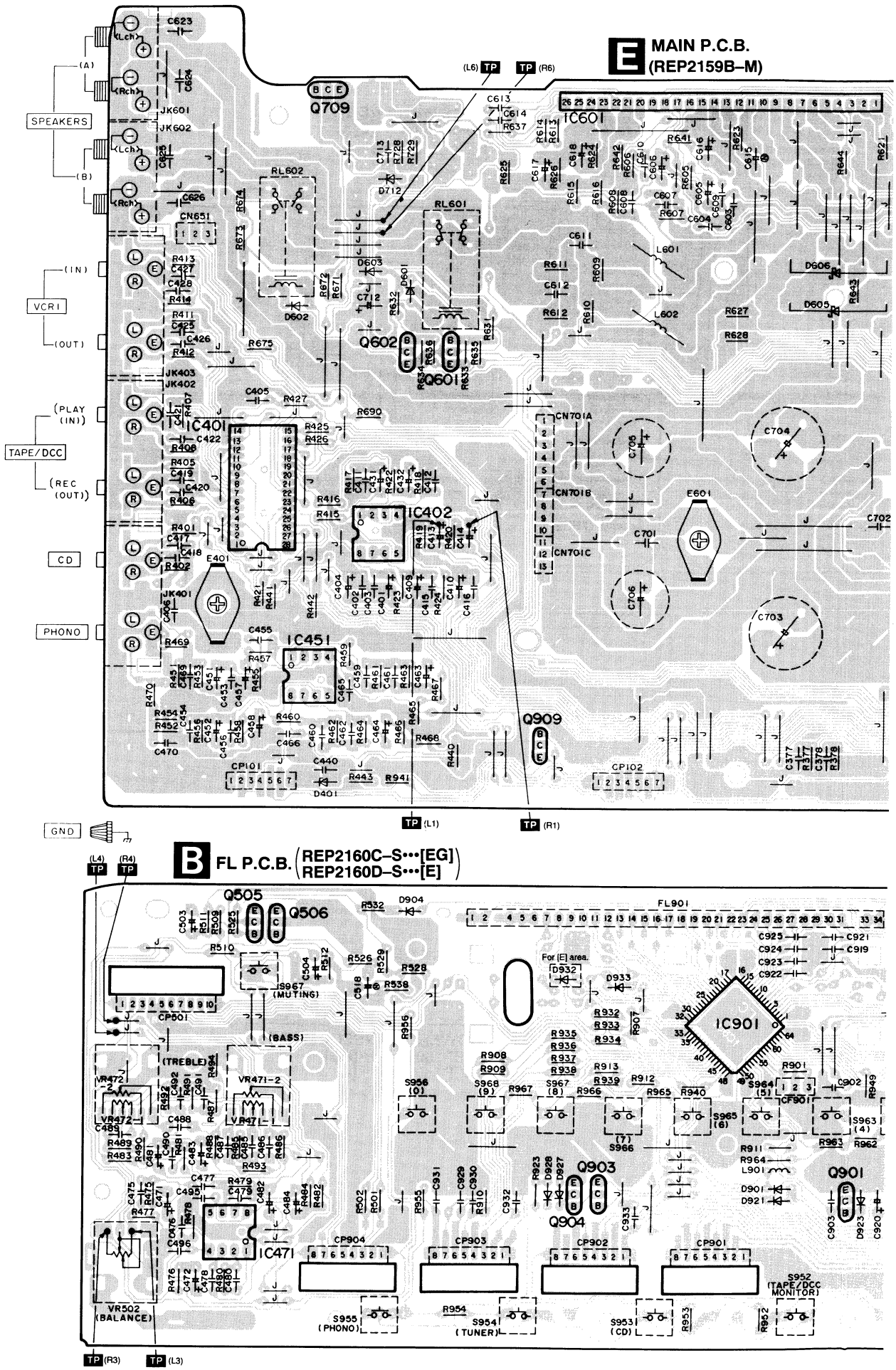


6 7 8 9 10

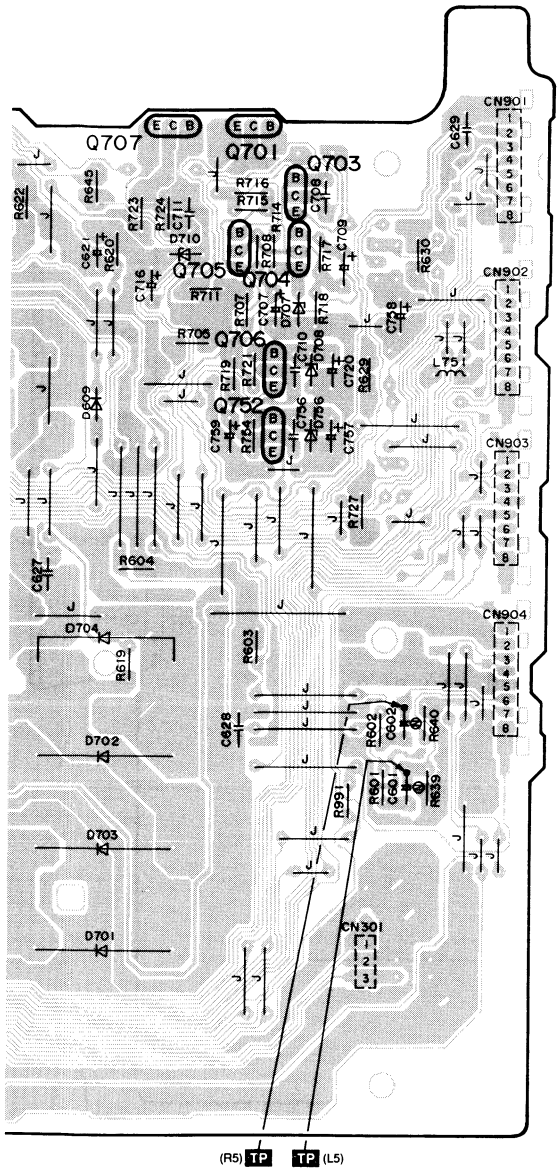
H POWER SUPPLY P.C.B. (REP1605H–P•••[EG] REP1605J–P••• [E])



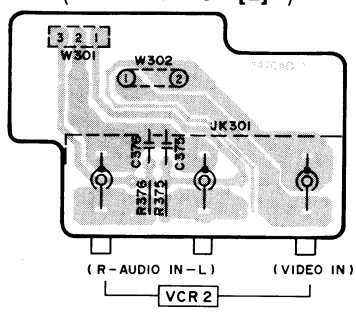
I POWER TRANSFORMER P.C.B. (REP1605H–P•••[EG] REP1605J–P••• [E])


E MAIN P.C.B. (REP2159B–M)
B FL P.C.B. (REP2160C–S•••[EG] REP2160D–S•••[E])
SPEAKERS
(A)
(B)
(IN)
VCR1
(OUT)
(PLAY (IN))
TAPE/DCC
(REC (OUT))
CD
PHONO
GND
Q709
Q602
Q601
Q909
IC601
IC401
IC402
IC451
RL602
RL601
E401
E601
CN651
CN701A
CN701B
CN701C
JK601
JK602
JK403
JK402
JK401
CP101
CP102
TP (L6)
TP (R6)
TP (L1)
TP (R1)
Q505
Q506
S967 (MUTING)
(BASS)
(TREBLE)
VR472-2
VR471-2
VR472
VR471
CP501
IC471
VR502 (BALANCE)
FL901
For [E] area.
D932
D933
IC901
S966 (7)
S965 (6)
S964 (5)
S963 (4)
S956 (0)
S968 (9)
S967 (8)
Q903
Q904
Q901
CP904
CP903
CP902
CP901
S955 (PHONO)
S954 (TUNER)
S953 (CD)
S952 (TAPE/DCC MONITOR)
TP (L4)
TP (R4)
TP (R3)
TP (L3)

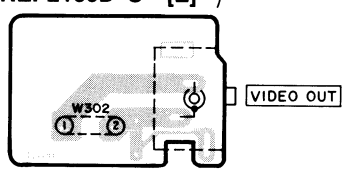
6 7 8 9 10

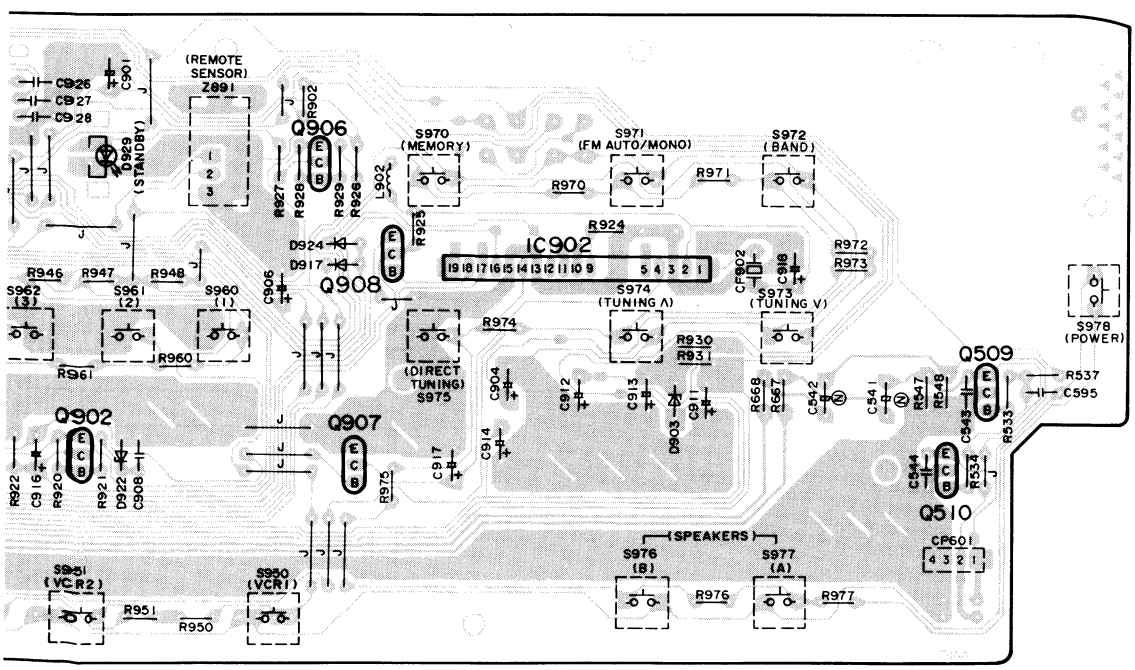


F **VCR2 P.C.B.**
(REP2160C–S•••[EG])
(REP2160D–S•••[E])

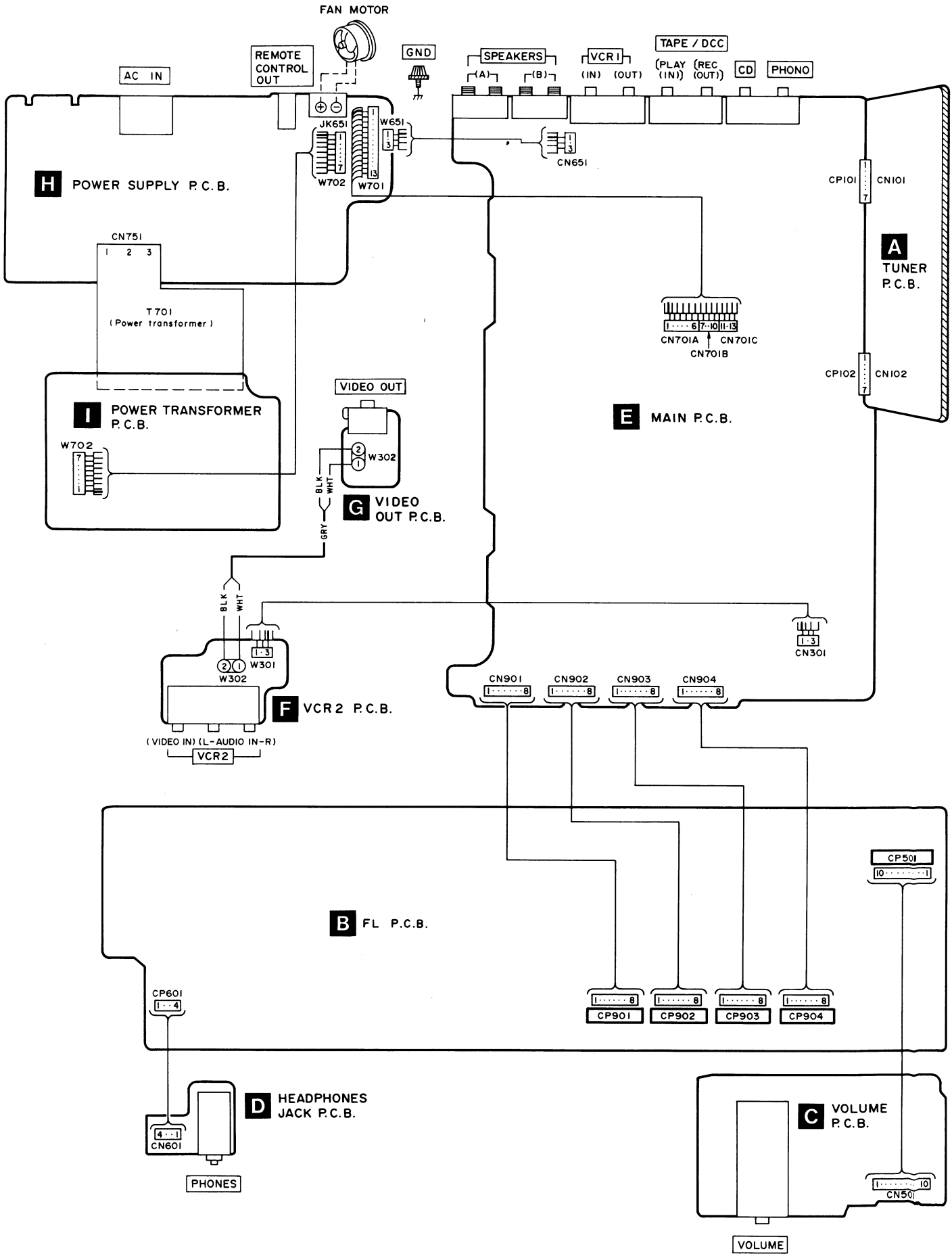


G **VIDEO OUT P.C.B.**
(REP2160C–S•••[EG])
(REP2160D–S•••[E])





■ WIRING CONNECTION DIAGRAM



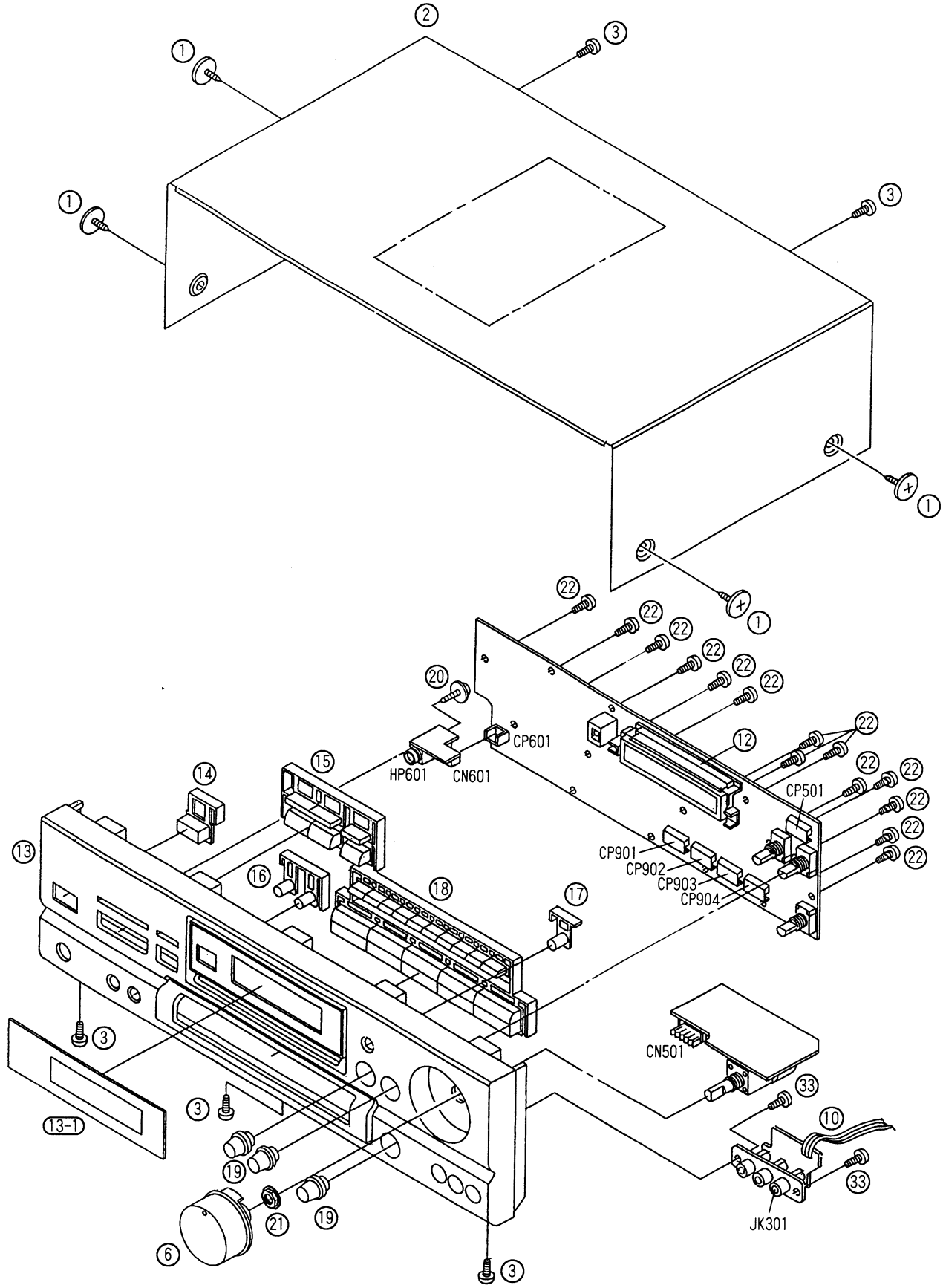
■ TERMINAL GUIDE

• IC901 (LC8A012C5756): Micro computer

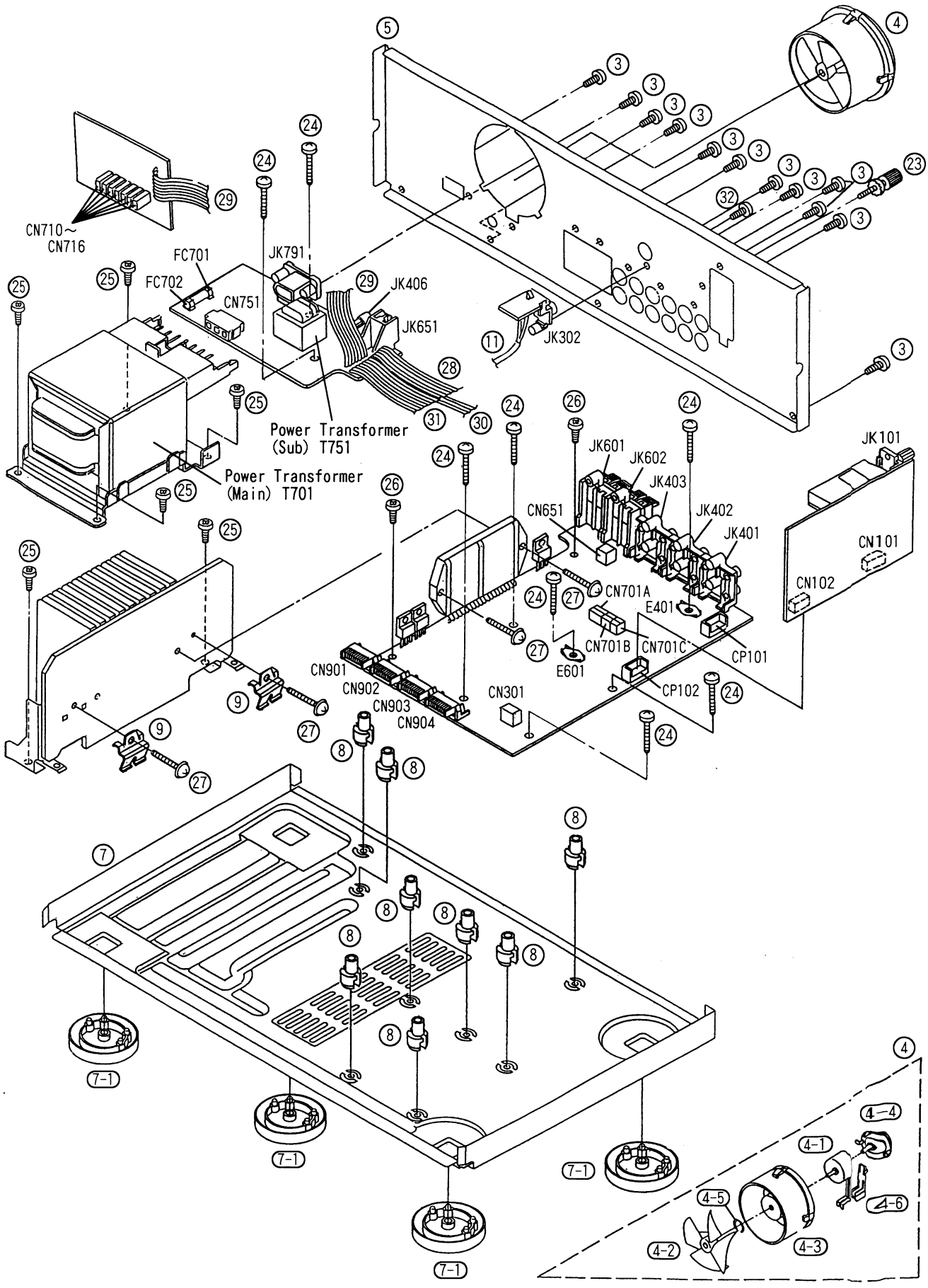
Pin No.	Mark	I/O Division	Function
1 • 2	SPA • SPB	O	Speaker select control terminal
3	RLY	O	Relay control terminal
4	AFM	O	Muting control terminal
5	NC	—	Non connection
6 ∫ 14	DG1 ∫ DG9	O	Digit signal of FL display
15 • 16	S16 • S15	O	Segment signal of FL display
17	VDD	I	Power supply terminal
18	VPP	I	Power supply terminal of FL display
19 ∫ 32	S14 ∫ S1	O	Segment signal of FL display
33 • 34	FWD • REV	O	Rotation control terminal of volume motor
35 • 36	NC	—	Non connection
37	INIT	I	Not used, connected to resistor
38	FMST	I	Stereo signal detect terminal
39	SD	I	Received signal detect terminal
40	IF IN	I	Serial data signal
41	DATA1	O	Serial data signal
42	CE	O	Chip enable terminal
43	CK1	O	Serial clock signal
44	ST1	O	Level shift control terminal

Pin No.	Mark	I/O Division	Function
45	RDSDT	I	RDS data input
46	RDSCK	I	RDS clock input
47	OVER LOAD	I	Overl load detect terminal
48	5−6	O	Remote control terminal
49	TEST1	—	Test terminal
50	RES	I	Reset detect terminal
51	XT1	I	Not used, connected to power supply
52	XT2	—	Not used, open
53	VSS	—	GND terminal
54	CF1	I	Crystal oscillator terminal (6MHz)
55	CF2	O	
56	VDD	I	Power supply terminal
57 ∫ 59	KEY1 ∫ KEY3	I	Key matrix detect terminal
60	NC	I	Not used, connected to resistor
61	HOLD	I	Hold signal input terminal
62	RDSST	I	RDS data start signalinput
63	RDSID	I	RDS ID signal input
64	REM	I	Remote control terminal

■CABINET PARTS LOCATION



6 7 8 9 10


CN710~
CN716
FC701
FC702
CN751
JK791
JK406
JK651
JK302
Power Transformer
(Sub) T751
Power Transformer
(Main) T701
JK601
JK602
JK403
JK402
JK401
JK101
CN651
CN701A
E401
CN701B
CN701C
CP101
CP102
E601
CN901
CN902
CN903
CN904
CN301
CN101
CN102
7-1
4-1
4-2
4-3
4-4
4-5
4-6

■ REPLACEMENT PARTS LIST

Notes: *Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
*[M] Indicates in Remarks columns parts that are supplied by MESA.

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	SNE2129-1	SCREW	
2	RKM0260B-KJ	CABINET	[M]
3	XTBS3+8JFZ1	SCREW	
4	REM0020-1	COOLING FAN UNIT	
4-1	MDN-4RB4MRC	FAN MOTOR	
4-2	SHE232-1	FAN	
4-3	RMQ0209-K	FAN CASE	
4-4	RMQ0208-K	FAN CAP	
4-5	SUS271	SPRING	
4-6	RMQ0212-K	FAN TERMINAL CAP	
5	RGR0178B-K1	REAR PANEL	[M] (E)
5	RGR0178B-J	REAR PANEL	[M] (EG)
6	RGW0145-1KJ	VOLUME KNOB	
7	RFKJAGX190PK	BOTTOM CHASSIS ASS'Y	[M]
7-1	RKA0053-A	FOOT	
8	RKQ0089	P. C. B. SUPPORT	
9	RMC0158-S	TRANSISTOR HOLDER	[M]
10	RWJ1803150QK	FLAT CABLE(3P) (W301)	
11	RFKEAGX170EK	CONNECTOR ASS'Y(2P) (W302)	
12	RMN0248-1	FL HOLDER	
13	RFKGAGX280EK	FRONT PANEL ASS'Y	[M]
13-1	RKW0317B-Q	TRANSPARENT PLATE	[M]
14	RFKNAGX170AK	POWER BUTTON ASS'Y	
15	RFKNAGX170BK	MODE BUTTON ASS'Y	
16	RFKNAGX170CK	SPEAKERS BUTTON ASS'Y	
17	RFKNAGX170DK	MUTING BUTTON ASS'Y	
18	RGU1057-K	SELECTOR BUTTON	
19	RGW0198-K	BALANCE/TREBLE/BASE KNOB	
20	RHD26016	SCREW	
21	RHN90001	NUT	
22	XTBS26+8J	SCREW	
23	SNE2123	GND TERMINAL	
24	XTB3+20JFZ	SCREW	
25	XTB3+8JFZ	SCREW	
26	XTWS3+8T	SCREW	
27	XTW3+15T	SCREW	
28	RWJ1806300KQ	FLAT CABLE(6P) (W701A)	
29	RWJ1807180KK	FLAT CABLE(7P) (W702)	
30	RWJ1803140KQ	FLAT CABLE(3P) (W651)	
31	RWJ1807300KQ	FLAT CABLE(7P) (W701B)	
32	XTBS3+8JFZ1	SCREW	
33	XTBS26+8J	SCREW	

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC101	LA1832A	FM/AM IF AMP. AM OSC	
IC102	LC7218	PLL FREQ. SYNTHESIZER	
IC401	NJU7312AL	INPUT SELECTOR	
IC402	M5218AP	BUFFER AMP	
IC451	AN6558-F	PHONO EQ AMP	[M]
IC471	UPC4570C	TONE CONTROL	
IC601	RSN3306A	POWER AMP	⚠
IC851	BA6218	MOTOR DRIVE	
IC901	LC8A012C5756	MICROCOMPUTER	[M]
IC902	STK311-010	RDS DECODER	[M]
		TRANSISTOR(S)	
Q101	2SC2787L	TRANSISTOR	
Q103, 104	2SC2785FE	TRANSISTOR	
Q106	UN411FTA	TRANSISTOR	
Q107, 108	2SC3311AR	TRANSISTOR	
Q191-193	2SC3311AR	TRANSISTOR	(E)
Q505, 506	2SC3311AR	TRANSISTOR	
Q509, 510	2SC3327-A	TRANSISTOR	
Q601, 602	2SA1309A-R	TRANSISTOR	
Q651, 652	2SA1309A-R	TRANSISTOR	
Q653	2SB621ARTA	TRANSISTOR	⚠
Q654, 655	2SA1309A-R	TRANSISTOR	
Q701	2SD2374PQAU	TRANSISTOR	⚠
Q703-705	2SC3311AR	TRANSISTOR	⚠
Q706	2SC3940AQSTA	TRANSISTOR	⚠
Q707	2SB1548PQAU	TRANSISTOR	⚠
Q709	2SB1548PQAU	TRANSISTOR	⚠
Q751	UN421FTA	TRANSISTOR	
Q752	2SC3940AQSTA	TRANSISTOR	⚠
Q901	RVTDTC114YST	TRANSISTOR	
Q902	2SA1309A-R	TRANSISTOR	⚠
Q903	RVTDTA144EST	TRANSISTOR	
Q904	RVTDTC114YST	TRANSISTOR	
Q906	2SA1309A-R	TRANSISTOR	
Q907	RVTDTC114YST	TRANSISTOR	
Q908	RVTDTC114EST	TRANSISTOR	
Q909	2SC3311AR	TRANSISTOR	
		DIODE(S)	
D101	MTZJ5R1BTA	DIODE	⚠

Ref. No.	Part No.	Part Name & Description	Remarks
D102	MA165	DIODE	
D401	MTZJ7R5CTA	DIODE	⚠
D601, 602	MA165	DIODE	
D603	MA700	DIODE	
D605, 606	SB360L6508	DIODE	
D609	MA165	DIODE	
D651	MA165	DIODE	
D652	MTZJ5R6BTA	DIODE	
D653	MA165	DIODE	
D701-704	P300DLF	DIODE	⚠
D707, 708	MTZJ6R2BTA	DIODE	⚠
D710	MTZJ22DTA	DIODE	⚠
D712	MTZJ16CTA	DIODE	⚠
D721-724	P300DLF	DIODE	⚠
D751-754	1SR35200TB	DIODE	⚠
D755	MA165	DIODE	
D756	MTZJ6R8CTA	DIODE	⚠
D901	1SS291TA	DIODE	
D903	MTZJ5R6BTA	DIODE	⚠
D904	MA165	DIODE	
D917	1SS291TA	DIODE	
D921	MA165	DIODE	
D922	MTZJ3R9ATA	DIODE	⚠
D923, 924	MA165	DIODE	
D927, 928	MA165	DIODE	
D929	LN846RPH	L. E. D.	
D932	MA165	DIODE	(E)
D933	MA165	DIODE	
		VARIABLE RESISTOR(S)	
VR471, 472	EVJYA1FA5C15	TONE CONTROL	
VR501	EUWMGB025B15	VOLUME CONTROL	
VR502	EVJ02QF02G15	BALANCE CONTROL	
		COIL(S)	
L101	ELESNR68MA	COIL	(E)
L101	ELESN1R0MA	COIL	(EG)
L103	ELEXTR47MA9	COIL	
L105, 106	RLQZB822KT-D	COIL	
L151	SLM1B10-1M	COIL	
L191	ELESNR68MA	COIL	(E)
L191	ELESNR56MA	COIL	(EG)
L591, 592	RLQZP1R0KT-Y	COIL	
L601, 602	RLQYR73M	COIL	
L701	SLQZ650MH49	COIL	⚠
L751	ELESN101KA	COIL	
L901, 902	RLQZP101KT-Y	COIL	
		TRANSFORMER(S)	

Ref. No.	Part No.	Part Name & Description	Remarks
T701	RTP1N5E014-V	POWER TRANSFORMER(MAIN)	⚠
T751	RTP1I5E003-V	POWER TRANSFORMER(SUB)	⚠
		COMPONENT COMBINATION(S)	
Z101	RLA6Z005M-T	COMPONENT COMBINATION	(E)
Z101	RLA2Z002M-T	COMPONENT COMBINATION	(EG)
Z102	RLI2Z006M-T	COMPONENT COMBINATION	
Z891	RCDHC-278N	REMOTE SENSOR	
		FILTER(S) AND OSCILLATOR(S)	
CF201	RLFFETNGD01L	FILTER	
CF202	RLFFETMGD01L	FILTER	
CF901	EF0EC6004T4	OSCILLATOR(6MHz)	
CF902	RSXZ456KM07M	OSCILLATOR(456KHz)	
X101	RSXZ456KM07M	OSCILLATOR(456KHz)	
X102	RLFDGTD01I	OSCILLATOR(10.65MHz)	
X103	SVQ49U722-S	OSCILLATOR(7.2MHz)	
		DISPLAY TUBE(S)	
FL901	RSL0205-F	DISPLAY TUBE	[M]
		FM FRONT END PACK ASS'Y(S)	
Z120	ENV17290G1R	FM FRONT END	
		FUSE(S)	
F1	XBA2C16TB0	FUSE, 250V, T1.6A	⚠
		SWITCH(ES)	
S950	EVQ21405R	VCR1	
S951	EVQ21405R	VCR2	
S952	EVQ21405R	TAPE/DCC MONITOR	
S953	EVQ21405R	CD	
S954	EVQ21405R	TUNER	
S955	EVQ21405R	PHONO	
S956	EVQ21405R	NUMERIC 0	
S957	EVQ21405R	MUTING	
S960	EVQ21405R	NUMERIC 1	
S961	EVQ21405R	NUMERIC 2	
S962	EVQ21405R	NUMERIC 3	
S963	EVQ21405R	NUMERIC 4	
S964	EVQ21405R	NUMERIC 5	
S965	EVQ21405R	NUMERIC 6	
S966	EVQ21405R	NUMERIC 7	
S967	EVQ21405R	NUMERIC 8	
S968	EVQ21405R	NUMERIC 9	
S970	EVQ21405R	MEMORY	

Ref. No.	Part No.	Part Name & Description	Remarks
S971	EVQ21405R	FM AUTO/MODE	
S972	EVQ21405R	BAND	
S973	EVQ21405R	TUNING DOWN	
S974	EVQ21405R	TUNING UP	
S975	EVQ21405R	DIRECT TUNING	
S976	EVQ21405R	SP-B	
S977	EVQ21405R	SP-A	
S978	EVQ21405R	POWER	
		RELAY(S)	
RL601, 602	RSY0013M-0	RELAY	⚠
RL751	RSY0019M-0	RELAY	⚠
		CONNECTOR(S) AND SOCKET(S)	
CN101, 102	RJU057W007	SOCKET(7P)	
CN301	RJS1A6603	CONNECTOR(3P)	
CN501	RJU003K010M1	SOCKET(10P)	
CN601	RJU057W004	SOCKET(4P)	
CN651	RJS1A6603	CONNECTOR(3P)	
CN701A	RJS1A6606	CONNECTOR(6P)	
CN701B	RJS1A6604	CONNECTOR(4P)	
CN701C	RJS1A6603	CONNECTOR(3P)	
CN710-716	RJS1A1101T1	CONNECTOR(1P)	
CN751	SJS305-1	CONNECTOR(3P)	
CN901-904	RJU003K008M1	SOCKET(8P)	
CP101, 102	RJT057W007-1	CONNECTOR(7P)	
CP501	RJT003K010M1	CONNECTOR(10P)	
CP601	RJT057W004-1	CONNECTOR(4P)	
CP901-904	RJT003K008-1	CONNECTOR(8P)	
		JACK(S) AND TERMINAL(S)	
JK101	RJH4202	ANT TERMINAL	
JK301	SJFK5-1	VCR2 IN TERMINAL	
JK302	SJFD7-6	VIDEO OUT TERMINAL	
JK401	SJF3069N	PHONO/CD TERMINAL	
JK402	SJF3069N	TAPE/DCC TERMINAL	
JK403	SJF3069N	VCR1 TERMINAL	
JK406	RJJ33TR01	REMOTE CONTROL OUT TERMINAL	
JK601	RJR0054	SPEAKERS(A) TERMINAL	
JK602	RJR0054	SPEAKERS(B) TERMINAL	
JK651	RJS1A7402-1	FAN MOTOR TERMINAL	
JK791	SJS9236	AC INLET	⚠
HP601	RJJ63TS01	HEADPHONES JACK	
		GND PLATE(S)	
E401	SNE1004-2	GND PLATE	
E601	SNE1004-2	GND PLATE	

Ref. No.	Part No.	Part Name & Description	Remarks
		FUSE HOLDER(S)	
FC701, 702	EYF52BC	FUSE HOLDER	

■ RESISTORS AND CAPACITORS

Notes : * Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM)

Ref.No.	Part No.	Values & Remarks
		RESISTORS
R103	ERDS2TJ101	1/4W 100
R104	ERDS2TJ102	1/4W 1K
R105	ERDS2TJ471	1/4W 470
R106	ERDS2TJ224T	1/4W 220K
R107	ERDS2TJ471	1/4W 470
R110	ERDS2TJ102	1/4W 1K
R112	ERDS2TJ104	1/4W 100K
R113	ERDS2TJ103	1/4W 10K
R114	ERDS2TJ562	1/4W 5.6K
R115	ERDS2TJ561	1/4W 560
R116	ERDS2TJ102	1/4W 1K
R117	ERDS2TJ473	1/4W 47K
R118	ERDS2TJ562	1/4W 5.6K
R119	ERDS2TJ183T	1/4W 18K
R120	ERDS2TJ473	1/4W 47K
R121	ERDS2TJ332	1/4W 3.3K
R122	ERDS2TJ272T	1/4W 2.7K
R124	ERDS2TJ271	1/4W 270
R125, 126	ERDS2TJ472	1/4W 4.7K
R127	ERDS2TJ103	1/4W 10K
R128	ERDS2TJ820	1/4W 82
R129	ERDS2TJ473	1/4W 47K
R130, 131	ERDS2TJ102	1/4W 1K
R132	ERDS2TJ103	1/4W 10K
R133-137	ERDS2TJ102	1/4W 1K
R139, 140	ERDS2TJ272T	1/4W 2.7K
R141, 142	ERDS2TJ102	1/4W 1K
R143, 144	ERDS2TJ222	1/4W 2.2K
R145, 146	ERDS2TJ102	1/4W 1K (E)
R145, 146	ERDS2TJ561	1/4W 560 (EG)
R147, 148	ERDS2TJ474	1/4W 470K
R149	ERDS2TJ680T	1/4W 68
R171, 172	ERDS2TJ102	1/4W 1K
R173	ERDS2TJ471	1/4W 470
R175	ERDS2TJ102	1/4W 1K
R176	ERDS2TJ391	1/4W 390
R181	ERDS2TJ332	1/4W 3.3K
R191	ERDS2TJ103	1/4W 10K (E)
R192	ERDS2TJ122	1/4W 1.2K (E)
R193	ERDS2TJ182	1/4W 1.8K (E)
R194	ERDS2TJ122	1/4W 1.2K (E)
R195	ERDS2TJ222	1/4W 2.2K (E)
R375, 376	ERDS2TJ102	1/4W 1K
R377, 378	ERDS2TJ223	1/4W 22K
R401, 402	ERDS2TJ102	1/4W 1K
R405-408	ERDS2TJ102	1/4W 1K
R411-416	ERDS2TJ102	1/4W 1K
R417, 418	ERDS2TJ473	1/4W 47K
R419-422	ERDS2TJ104	1/4W 100K
R423, 424	ERDS2TJ102	1/4W 1K
R425-427	ERDS2TJ103	1/4W 10K
R440	ERDS1FVJ820T	1/2W 82 ⚠
R441, 442	ERDS2TJ473	1/4W 47K
R443	ERDS2TJ330	1/4W 33
R451, 452	ERDS2TJ224T	1/4W 220K
R453, 454	ERDS2TJ391	1/4W 390
R455, 456	ERDS2TJ563	1/4W 56K
R457, 458	ERDS2TJ271	1/4W 270
R459, 460	ERDS2TJ680T	1/4W 68
R461, 462	ERDS2TJ184T	1/4W 180K
R463, 464	ERDS2TJ123	1/4W 12K
R465, 466	ERDS2TJ563	1/4W 56K
R467-470	ERDS2TJ102	1/4W 1K
R475, 476	ERDS2TJ471	1/4W 470
R477-480	ERDS2TJ474	1/4W 470K
R481, 482	ERDS2TJ152	1/4W 1.5K
R483, 484	ERDS2TJ392T	1/4W 3.9K
R485, 486	ERDS2TJ223	1/4W 22K
R487, 488	ERDS2TJ392T	1/4W 3.9K
R489, 490	ERDS2TJ222	1/4W 2.2K
R491, 492	ERDS2TJ122	1/4W 1.2K
R493, 494	ERDS2TJ333	1/4W 33K
R501, 502	ERDS2TJ222	1/4W 2.2K
R503, 504	ERDS2TJ103	1/4W 10K
R509-512	ERDS2TJ332	1/4W 3.3K
R525, 526	ERDS2TJ102	1/4W 1K
R528	ERDS2TJ822	1/4W 8.2K
R529	ERDS2TJ824	1/4W 820K
R532-534	ERDS2TJ102	1/4W 1K
R537	ERDS2TJ102	1/4W 1K
R538	ERDS2TJ472	1/4W 4.7K
R547, 548	ERG1SJ820E	1W 82
R591	ERDS1FVJ2R2T	1/2W 2.2 ⚠
R601, 602	ERDS2TJ221	1/4W 220
R603, 604	ERDS2TJ563	1/4W 56K
R605, 606	ERDS2TJ182	1/4W 1.8K
R607, 608	ERDS2TJ563	1/4W 56K
R609, 610	ERDS2TJ100	1/4W 10
R611, 612	ERDS1FVJ100T	1/2W 10 ⚠
R613, 614	ERDS2TJ102	1/4W 1K
R615	ERDS2TJ184T	1/4W 180K
R616	ERDS2TJ154	1/4W 150K
R619	ERDS2TJ684	1/4W 680K
R620	ERDS2TJ473	1/4W 47K
R621, 622	ERD25FVJ180T	1/4W 18 ⚠
R623	ERDS2TJ684	1/4W 680K
R624	ERDS2TJ224T	1/4W 220K
R625	ERD25FJ220	1/4W 22 ⚠
R626	ERDS2TJ473	1/4W 47K
R627-630	ERG1SJ101E	1W 100
R631, 632	ERDS2TJ223	1/4W 22K
R633, 634	ERDS2TJ103	1/4W 10K
R635, 636	ERDS2TJ102	1/4W 1K
R637	ERDS2TJ472	1/4W 4.7K
R639, 640	ERDS2TJ474	1/4W 470K
R641, 642	ERDS2TJ221	1/4W 220
R643, 644	ERDS2TJ154	1/4W 150K
R645	ERDS2TJ183T	1/4W 18K
R667, 668	ERG1SJ121E	1W 120
R671-674	ERDS2TJ223	1/4W 22K
R675	ERDS2TJ682T	1/4W 6.8K
R681	ERDS2TJ332	1/4W 3.3K
R682	ERDS1FVJ220T	1/2W 22 ⚠
R683	ERDS2TJ103	1/4W 10K
R684	ERDS2TJ153	1/4W 15K
R685, 686	ERDS2TJ333	1/4W 33K
R687	ERDS2TJ103	1/4W 10K
R688	ERDS2TJ222	1/4W 2.2K
R689	ERDS2TJ270T	1/4W 27
R690	ERDS2TJ223	1/4W 22K
R691	ERDS2TJ104	1/4W 100K
R692	ERDS2TJ103	1/4W 10K
R693	ERDS2TJ223	1/4W 22K
R694	ERDS2TJ335T	1/4W 3.3M
R705	ERDS1FVJ6R8T	1/2W 6.8 ⚠
R707	ERDS2TJ332	1/4W 3.3K
R708	ERDS2TJ102	1/4W 1K
R711	ERD25FVJ221T	1/4W 220 ⚠
R714	ERDS2TJ472	1/4W 4.7K
R715, 716	ERDS2TJ1R5T	1/4W 1.5
R717	ERDS2TJ752T	1/4W 7.5K
R718	ERDS2TJ682T	1/4W 6.8K
R719	ERDS1FVJ220T	1/2W 22 ⚠
R721	ERDS2TJ182	1/4W 1.8K
R723	ERD25FVJ4R7T	1/4W 4.7 ⚠
R724	ERDS2TJ122	1/4W 1.2K
R727	ERD25FVJ180T	1/4W 18 ⚠
R728	ERDS1FVJ100T	1/2W 10 ⚠
R729	ERDS2TJ152	1/4W 1.5K
R754	ERDS2TJ102	1/4W 1K
R901	ERDS2TJ102	1/4W 1K
R902	ERDS2TJ681	1/4W 680
R907-911	ERDS2TJ104	1/4W 100K
R912	ERDS2TJ102	1/4W 1K

Ref. No.	Part No.	Values & Remarks
R913	ERDS2TJ104	1/4W 100K
R920	ERDS2TJ271	1/4W 270
R921	ERDS2EJ121	1/4W 120
R922	ERDS2TJ472	1/4W 4.7K
R923	ERDS2TJ102	1/4W 1K
R924	ERDS2TJ333	1/4W 33K
R925	ERDS2TJ472	1/4W 4.7K
R926	ERDS2TJ122	1/4W 1.2K
R927	ERDS2TJ181T	1/4W 180
R928	ERDS2TJ222	1/4W 2.2K
R929	ERDS2TJ562	1/4W 5.6K
R930, 931	ERDS2TJ101	1/4W 100
R932-940	ERDS2TJ102	1/4W 1K
R941	ERDS2TJ472	1/4W 4.7K
R946-948	ERDS2TJ103	1/4W 10K
R949	ERDS2TJ104	1/4W 100K
R950	ERDS2TJ102	1/4W 1K
R951	ERDS2TJ122	1/4W 1.2K
R952	ERDS2TJ152	1/4W 1.5K
R953	ERDS2TJ182	1/4W 1.8K
R954	ERDS2TJ222	1/4W 2.2K
R955	ERDS2TJ332	1/4W 3.3K
R956	ERDS2TJ472	1/4W 4.7K
R960	ERDS2TJ102	1/4W 1K
R961	ERDS2TJ122	1/4W 1.2K
R962	ERDS2TJ152	1/4W 1.5K
R963	ERDS2TJ182	1/4W 1.8K
R964	ERDS2TJ222	1/4W 2.2K
R965	ERDS2TJ332	1/4W 3.3K
R966	ERDS2TJ472	1/4W 4.7K
R967	ERDS2TJ682T	1/4W 6.8K
R970	ERDS2TJ102	1/4W 1K
R971	ERDS2TJ122	1/4W 1.2K
R972	ERDS2TJ152	1/4W 1.5K
R973	ERDS2TJ182	1/4W 1.8K
R974	ERDS2TJ222	1/4W 2.2K
R975	ERDS2TJ332	1/4W 3.3K
R976	ERDS2TJ472	1/4W 4.7K
R977	ERDS2TJ682T	1/4W 6.8K
R991	ERDS2TJ103	1/4W 10K
		CAPACITORS
C101	ECBT1C103NS5	16V 0.01U
C103	ECBT1C103NS5	16V 0.01U
C104	ECBT1H102KB5	50V 1000P
C105	ECBT1H470J5	50V 47P
C106	ECBT1C103NS5	16V 0.01U
C107	ECBT1H473ZF5	50V 0.047U
C108	ECBT1H100JC5	50V 10P (E)
C108	ECBT1H8R2KC5	50V 8.2 (EG)
C109, 110	ECBT1C103NS5	16V 0.01U

Ref. No.	Part No.	Values & Remarks
C111	ECEA1EKA4R7B	25V 4.7U
C112	ECBT1C103NS5	16V 0.01U
C113	ECBT1H102KB5	50V 1000P
C114	ECEA1HKA3R3B	50V 3.3U
C115	ECEA1EKA4R7B	25V 4.7U
C116	ECBT1C822MS5	16V 8200P
C117	ECQB1H471JF3	50V 470P
C118, 119	ECQB1H103JF3	50V 0.01U
C120, 121	ECEA1HKA010B	50V 1U
C122	ECEA1HKA2R2B	50V 2.2U
C123	ECEA1HKA010B	50V 1U
C124	ECBT1H102KB5	50V 1000P
C125	ECBT1H150JC5	50V 15P
C126	ECBT1H104ZF5	50V 0.1U
C127	ECEA1CKA220B	16V 22U
C128	ECBT1C103NS5	16V 0.01U
C129, 130	ECEA0JKA101B	6.3V 100U
C131	ECBT1C103NS5	16V 0.01U
C132	ECBT1H102KB5	50V 1000P
C133	ECBT1H150JC5	50V 15P
C134	ECBT1H180JC5	50V 18P
C135, 136	ECBT1C103MS5	16V 0.01U
C137, 138	ECBT1H561KB5	50V 560P
C139, 140	ECQB1H682JF3	50V 6800P
C141-144	ECEA1HKA010B	50V 1U
C145	ECBT1H220JC5	50V 22P
C146	ECBT1H331KB5	50V 330P
C147	ECBT1H102KB5	50V 1000P
C148, 149	ECBT1C103NS5	16V 0.01U
C150	ECBT1H104ZF5	50V 0.1U
C172	ECBT1H331KB5	50V 330P
C173	ECEA1CKA220B	16V 22U
C174	ECEA1CKA101B	16V 100U
C175, 176	ECBT1C103NS5	16V 0.01U
C181	ECBT1H471KB5	50V 470P
C196	ECBT1H102KB5	50V 1000P
C375, 376	ECBT1H221KB5	50V 220P
C377, 378	ECBT1H821KB5	50V 820P
C401	ECEA1VKA4R7B	35V 4.7U
C402, 403	ECBT1E103ZF	25V 0.01U
C404	ECEA1VKA4R7B	35V 4.7U
C405	ECBT1H101KB5	50V 100P
C406	ECBT1H102KB5	50V 1000P
C409, 410	ECEA1CKA220B	16V 22U
C411, 412	ECBT1H101KB5	50V 100P
C413, 414	ECEA1CKA100B	16V 10U
C415, 416	ECBT1E103ZF	25V 0.01U
C417, 418	ECBT1H101KB5	50V 100P
C419-422	ECBT1H331KB5	50V 330P
C425, 426	ECBT1H101KB5	50V 100P
C427, 428	ECBT1H221KB5	50V 220P
C431, 432	ECEA1CKA100B	16V 10U

Ref. No.	Part No.	Values & Remarks
C440	ECBT1E103ZF	25V 0.01U
C451, 452	ECEA1VKA4R7B	35V 4.7U
C453, 454	ECBT1H100JC5	50V 10P
C455, 456	ECBT1H102KB5	50V 1000P
C457, 458	ECEA1AKA330B	10V 33U
C459, 460	ECFR1E223KR	25V 0.022U
C461, 462	ECFR1E682KR	25V 6800P
C463, 464	ECEA1VKA4R7B	35V 4.7U
C465, 466	ECBT1E103ZF	25V 0.01U
C469, 470	ECBT1H181KB5	50V 180P
C471, 472	ECEA1HKA3R3B	50V 3.3U
C475, 476	ECBT1H150J5	50V 15P
C477, 478	ECBT1H221KB5	50V 220P
C479, 480	ECBT1H560J5	50V 56P
C481-484	ECEA1VKA4R7B	35V 4.7U
C485, 486	ECFR1E123KR	25V 0.012U
C487, 488	ECQV1H683JZ3	50V 0.068U
C489, 490	ECBT1C562KR5	16V 5600P
C491, 492	ECFR1E273KR	25V 0.027U
C495, 496	ECBT1E103ZF	25V 0.01U
C503, 504	ECEA1VKA4R7B	35V 4.7U
C518	ECEA1HKN010B	50V 1U
C541, 542	ECEA1HN100SB	50V 10U
C543, 544	ECBT1C332KR5	16V 3300P
C591, 592	ECEA0JKA101B	6.3V 100U
C593, 594	ECFR1E104KR	25V 0.1U
C595	ECBT1E103ZF	25V 0.01U
C601, 602	ECEA1HKN2R2B	50V 2.2U
C603, 604	ECBT1H561KB5	50V 560P
C605, 606	ECA1JM330B	63V 33U
C607, 608	ECCR1H100K5	50V 10P
C609, 610	ECBT1H151KB5	50V 150P
C611, 612	ECQV1H473JZ3	50V 0.047U
C613, 614	ECBA1H681KB5	50V 680P
C615	ECEA2AN2R2SB	100V 2.2U
C616	ECEA2AU100	100V 10U
C617	ECA1HM470B	50V 47U
C618	ECEA2AU100	100V 10U
C621	ECEA2AU100	100V 10U
C623-626	ECKT1H223ZF	50V 0.022U
C627	ECKR2H101KB5	500V 100P
C628	ECBT1H101KB5	50V 100P
C629	ECBT1E223ZF	25V 0.022U
C651	ECEA1HKA2R2B	50V 2.2U
C652	ECEA1CKA100B	16V 10U
C653	ECBT1E223ZF	25V 0.022U
C655	ECEA0JKA221B	6.3V 220U
C701	ECBT1E103ZF	25V 0.01U
C702	ECQE2104KF3	250V 0.1U
C703, 704	ECES56V472NX	56V 4700U ⚠
C705, 706	ECA1VM472B	35V 4700U ⚠
C707	RCE1VM101BV	35V 100P

Ref. No.	Part No.	Values & Remarks
C708	ECKR1H103ZF5	50V 0.01U
C709	ECEA1CKA330B	16V 33U
C710	ECBT1E103ZF	25V 0.01U
C711	ECKR1H103ZF5	50V 0.01U
C712	ECA1HM470B	50V 47U
C713	ECKR1H103ZF5	50V 0.01U
C716	ECEA2AU100	100V 10U
C720	ECEA1EKA220B	25V 22U
C722	ECQE2104KF3	250V 0.1U
C751	ECKWNS102MBM	400V 1000P ⚠
C752	ECKR1H103ZF5	50V 0.01U

Ref. No.	Part No.	Values & Remarks
C753	ECA1EM102B	25V 1000U ⚠
C756	ECBT1E103ZF	25V 0.01U
C757	ECEA1CKA470B	16V 47U
C758	ECEA1AKA101B	10V 100U
C759	ECEA1EKA220B	25V 22U
C891	ECFR1E392KR	25V 3900P
C901	ECA0JM102B	6.3V 1000U
C902	ECBT0J223MS5	6.3V 0.022U
C903	ECBT1E103ZF	25V 0.01U
C904	ECA0JM471B	6.3V 470U
C906	ECEA0JKA101B	6.3V 100U

Ref. No.	Part No.	Values & Remarks
C908	ECBT1E103ZF	25V 0.01U
C911, 912	ECEA2AU100	100V 10U
C913, 914	ECEA1VKA100B	35V 10U
C916	ECEA1HKA010B	50V 1U
C917	ECEA1HKAR47B	50V 0.47U
C918	ECEA0JKA221B	6.3V 220U
C919	ECBT1H331KB5	50V 330P
C920	ECEA1HKA010B	50V 1U
C921-928	ECBT1H331KB5	50V 330P
C929-932	ECBT1H101KB5	50V 100P
C933	ECBT1E103ZF	25V 0.01U

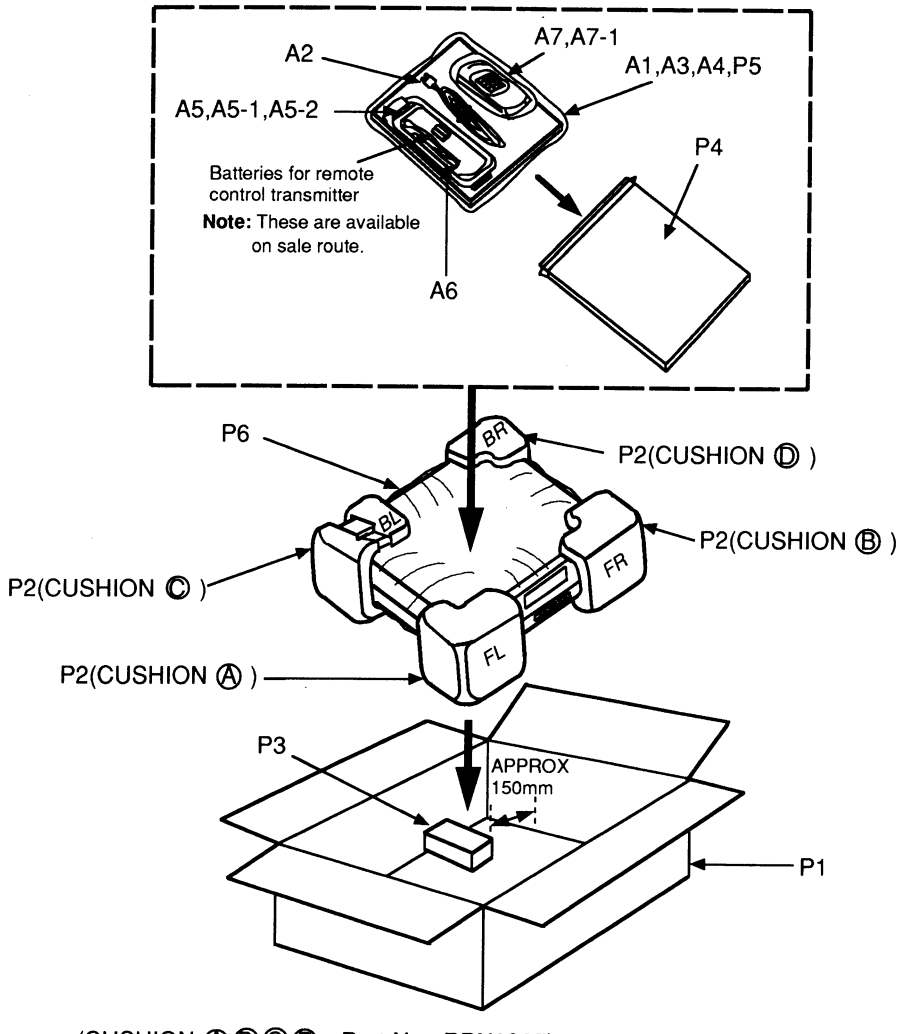
■ REPLACEMENT PARTS LIST

Notes: *Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
*[M] Indicates in Remarks columns parts that are supplied by MESA.
*The "(SF)" mark denotes the standard part.

Ref. No.	Part No.	Part Name & Description	Remarks
		PACKING MATERIAL	
P1	RPG2584	PACKING CASE	[M]
P2	RPN0865	CUSHION	[M]
P3	RPNX0047	POLYFORM PAD	[M]
P4	SPSD152	ACCESORIES BOX	
P5	XZB24X33C04	PROTECTION BAG(F.B.)	
P6	RPFX0005	PROTECTION BAG(UNIT)	[M]
		ACCESSORIES	
A1	RFKSAGX180E	INSTRUCTION MANUAL ASS'Y	[M](E)
A1	RFKSAGX180EG	INSTRUCTION MANUAL ASS'Y	[M](EG)
A2	RJA0019-2K	AC POWER SUPPLY CORD	⚠(SF)
A3	RQA0013	WARRANTY CARD	
A4	RQCB0169	SERVICENTER LIST	
A5	RSA0010	AM LOOP ANTENNA SET	

Ref. No.	Part No.	Part Name & Description	Remarks
A5-1	RMN0244	AM ANTENNA HOLDER	
A5-2	XTN3+12AFZ	SCREW	
A6	SSA270M	FM INDOOR ANTENNA	
A7	EUR643861	REMOTE CONTROL TRANSMITTER	[M]
A7-1	UR64EC1371	BATTERY COVER	FOR R/C TRANSMITTER
		<GREASE OR JIG/TOOL>	
		GREASE	
SA1	RFKX0002	COMPOUND GREASE	
		TEST DISC	
SA2	SZZP1054C	UNEVEN TEST DISC	
		TEST TAPE	
SA3	QZZCLA	DISTORTION ADJUSTMENT	

■ PACKAGING



(CUSHION ⒶⒷⒸⒹ : Part No. RPN0865)

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